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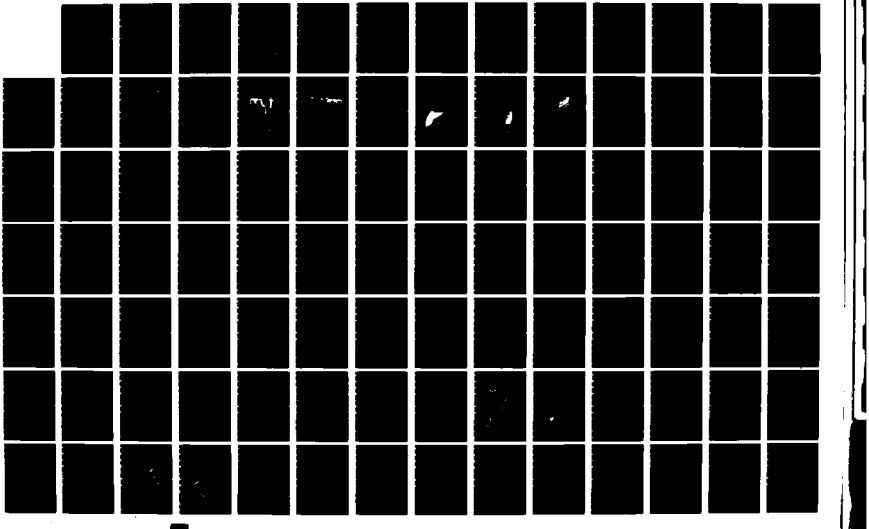

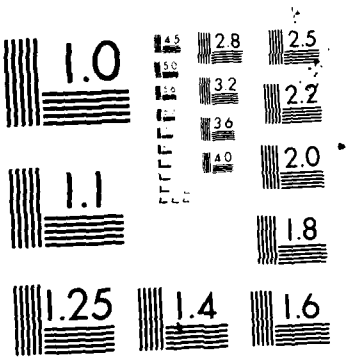

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The University of South Dakota conducted a cultural resource survey of all lands held in fee title at the Lake Traverse- Bois des Sioux project. The cultural resource investigation consisted of a Phase II, 100 percent pedestrian reconnaissance of all surveyable fee title lands which permitted examination of the ground surface, minimum site testing, and records searches.

Field reconnaissance resulted in recording three new sites. The sites contain two prehistoric components and one historic component. The prehistoric components are attributed to late prehistoric occupation of the area. The historic component is an early 20th century Euro-American farmstead. It is recommended that two sites are potentially significant. The two sites are a large, prehistoric village and the historic farmstead. A proposal for Phase III preservation and mitigation for the known cultural resources is developed.

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by

Dennis Beissel
Barbara Biggs
Kenneth L. Brown
Marie E. Brown

for

Department of the Army
St. Paul District, Corps of Engineers
1135 U.S. Post Office and Custom House
St. Paul, Minnesota 55101

Contract No. DACW37-82-M-2193

Principal Investigator
Kenneth L. Brown

The University of South Dakota Archaeology Laboratory
Vermillion, South Dakota
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ABSTRACT

During the fall of 1982 The University of South Dakota Archaeology Laboratory entered into contractural agreement with the St. Paul District Corps of Engineers to conduct a cultural resources survey of all lands held in fee title at the Lake Traverse - Bois de Sioux project, Roberts County, South Dakota and Traverse County, Minnesota. The cultural resource investigations consisted of a Phase II, 100 percent pedestrian reconnaissance of all surveyable fee title lands (i.e., project lands which were not underwater) which permitted examination of the ground surface, minimum site testing, and literature and records searches.

Field reconnaissance resulted in recording three new sites. The sites contain two prehistoric components and one historic component. The prehistoric components are attributed to late prehistoric occupation of the area. The historic component is an early 20th century Euro-American farmstead. It is recommended that two of these sites are potentially significant. The two sites are a large, prehistoric village (39RO45/21TR35) and a historic farmstead (39RO44). A search of the South Dakota and Minnesota site files for Roberts and Traverse counties, respectively, yielded information that allowed inferences to be made concerning prehistoric and historic settlement patterns. A proposal for Phase III preservation and mitigation for the known cultural resources is developed.

MANAGEMENT SUMMARY

During the fall of 1982 The University of South Dakota Archaeology Laboratory entered into contractual agreement with the St. Paul District Corps of Engineers to conduct a Phase II cultural resources investigation of fee title lands of the Lake Traverse - Bois de Sioux project. Field work was initiated in October 1982 and was completed in November 1982. The project entailed a 100 percent pedestrian reconnaissance of approximately 450 acres (of a total of 1,521.9 acres) held in fee title by the U.S. Army Corps of Engineers.

The literature and records searches were intensive, as was the pedestrian reconnaissance. Records were examined at the Minnesota and South Dakota Historic Preservation offices, and the South Dakota State site files at the University of South Dakota. Land ownership records were examined at the Roberts and Traverse County courthouses. Libraries used include the South Dakota Historical Society (Pierre), the Minnesota Historical Society (St. Paul), the Minnesota Historical Society Research Center (St. Paul), the Minnesota Historical Society (Ft. Snelling), and the I.D. Weeks Library on the campus of the University of South Dakota, (Vermillion). Other sources used include the local newspapers (Sisseton Courier, Valley News), and the U.S. General Land Office survey maps and records which were available at the Office of School and Public Lands in Pierre, South Dakota and at the Secretary of State's Office in St. Paul, Minnesota. Six local informants were interviewed because of their knowledge of the prehistory and history of the project area. Those interviewed include Marie and O'Donald Simonson, Henry Alsaker, and Fred Trende of Rosholt, South Dakota; Mrs. Harold Gibson of Beardsley, Minnesota and Virginia Bigelow of Browns Valley, Minnesota.

Field work, consisting of intensive pedestrian reconnaissance with shovel testing and excavation of 1 x 1 meter test pits, resulted in recording three new sites. The three sites contain two late prehistoric components and one historic, early 20th century component. The two prehistoric sites (39RO45/21TR35, 21TR36) are not in immediate danger of adverse impacts from operation of the Lake Traverse - Bois de Sioux project. Portions of the historic site (39RO44) are periodically inundated by impounded waters in Mud Lake. The test excavations indicate subsurface cultural remains are present at the large prehistoric site (39RO45/21TR35) and the historic site (39RO44). Site 21TR36 has been subjected to erosion. No subsurface cultural remains were discerned.

The large prehistoric site (39RO45/21TR35) and historic site (39RO44) may be potentially significant. The prehistoric site potentially contains significant scientific information which may help elucidate the prehistory of the region. Portions of the site may also be associated with Standing Buffalo's Village (ca. early 1800's to 1860's). The historic

site potentially contains significant information concerning the early Euro-American settlement of the Sisseton-Wahpeton Reservation after it was opened to settlement.

A search of the Minnesota site files indicates almost all sites recorded in Traverse County are mounds. The mound sites are located upon prominent ridge tops overlooking Lake Traverse and/or river valleys. Few village sites have been investigated. The Browns Valley Man site (21TR5) has been nominated to the National Register, but because the site has been destroyed by gravel quarrying activities, it is not on the National Register.

A search of the South Dakota site files indicates a correlation exists between soil types defined by the Soil Conservation Service and recorded sites. Mound sites are located on prominent ridge tops that have Heimdal-Svea and Peever soil complexes. Prehistoric habitation sites are found on the uplands with the Heimdal-Svea soil complex and on low bottom lands with the LaDelle soil omplex. The upland habitation sites may represent summer and fall occupations while the bottom land sites may represent winter and spring occupations. Stone alignments occur most frequently on rolling uplands with the Renshaw-Sioux soil complex. Historic sites are associated with all topographic situations and a variety of soil complexes.

A proposal for Phase III preservation and mitigation for known cultural resources within the Lake Traverse-Bois de Sioux project includes two different plans: (1) system-atic excavation of 1 x 1 meter test pits and (2) the preservation of cultural resources by avoiding future adverse impacts or, if avoidance is not possible, systematic excavation of contiguous 1 x 1 meter excavation units. Test excavations are recommended for both potentially significant sites, 39RO44 and 39RO45/21TR35. Preservation/contiguous excavations are also recommended for both sites if test excavations determine they are significant.

The literature and records searches, in conjuction with the cultural resource investigations, indicate the Lake Traverse area has been used extensively by prehistoric and historic peoples. These resources may potentially yield significant information which may help elucidate the culture history of the region. A greater number of cultural resources were not found on lands held in fee title by the Corps of Engineers because of the geologic situation of these lands and the geomorphic processes that led to their formation.

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ACKNOWLEDGEMENTS

Financial support for field survey and records and literature searches was made possible by a contract between the St. Paul District, U.S. Army Corps of Engineers and the University of South Dakota, Vermillion. The authors would like to thank the many people who contributed assistance toward the completion of this project: Mona Greseth, Register of Deeds, Roberts County Courthouse; Edna MacNiss, County Recorder and Margarie Krumwiede, Deputy County Recorder, Traverse County Courthouse; Jack Adams, Editor, Sisseton Courier; Betti Lals, The Valley News; Alice Lentz of the South Dakota Historical Society; Wiley Pope and Jan Christinsen of the Minnesota Historical Society; Ruby Shields f the Minnesota Historical Society Research Center; Bob Clouse and Scott Anfinson of the Minnesota Archaeological Society, Fort Snelling; Steve Ruple of the South Dakota Office of Historic Preservation, Vermillion; and Mike Lawson of the Bureau of Indian Affairs, Aberdeen, South Dakota.

Local residents who provided invaluable information were Marie and O'Donald Simonson, Henry Alsaker, Fred Trende of Rosholt, South Dakota; Mrs. Harold Gibson of Beardsley, Minnesota, and Virginia Bigelow of Browns Valley, Minnesota.

Special thanks go to Dave Salberg, Manager of Lake Traverse - Bois de Sioux project and Sandy Blaylock of the St. Paul District, U.S. Army Corps of Engineers for their guidance and assistance during the project.

CHAPTER 1

Project Background

Introduction

This report presents the findings of archaeological and historical investigations within lands held in fee title by the U.S. Army Corps of Engineers at the Lake Traverse-Bois de Sioux project, Roberts County, South Dakota and Traverse County, Minnesota (Fig. 1). The investigations were funded by the St. Paul District of the U.S. Army Corps of Engineers. During the fall of 1982 The University of South Dakota Archaeology Laboratory entered into contractual agreement, Number DACW37-82-M-2193, in assessing the frequency and significance of archaeological, historical and architectural resources within the project area. The sites recorded on fee title lands of the U.S. Army Corps of Engineers are shown on a series of topographic maps. The index map (Fig. 2) shows the positions of each of the individual topographic maps for the project area (Figs. 3-8).

The work defined herein is called for in the National Historic Preservation Act of 1966 (P.L. 89-665), as amended; the National Environmental Policy Act of 1969 (P.L. 91-190); Executive Order 11593 for the "Protection and Enhancement of the Cultural Environment"; the Archaeological and Historical Preservation Act of 1974 (P.L. 93-291); the Advisory Council on Historic Preservation "Regulations for the Protection of Historic and Cultural Properties" (36 CFR Part 800); the Department of the Interior guidelines concerning cultural resources (36 CFR Part 60); and the Corps of Engineers regulations (ER 1105-2-50).

The investigations undertaken herein will serve several functions: (1) the report will be a planning tool to aid the U.S. Army Corps of Engineers in meeting its obligations to preserve and protect our cultural heritage; (2) the report is a comprehensive, scholarly document that fulfills federally mandated legal requirements and serves as a reference for future professional research; and (3) the report identifies sites which require additional investigations.

The Lake Traverse-Bois de Sioux Project

The Lake Traverse-Bois de Sioux flood control project was approved on June 28, 1938, under authorization of the Flood Control Act of 1936. Construction of dams was begun in 1939 and completed in 1941. The project facilities began operating on December 1, 1941. Construction included the building of the White Rock and Reservation dams (Figs. 3-7). Both dams are of rolled earth-fill construction as is the Browns Valley Dike (Fig. 8). Concrete and metal structures with spillways control water flow from Lake Traverse and Mud Lake to the Bois de Sioux River, the primary tributary of the Red River of the North.

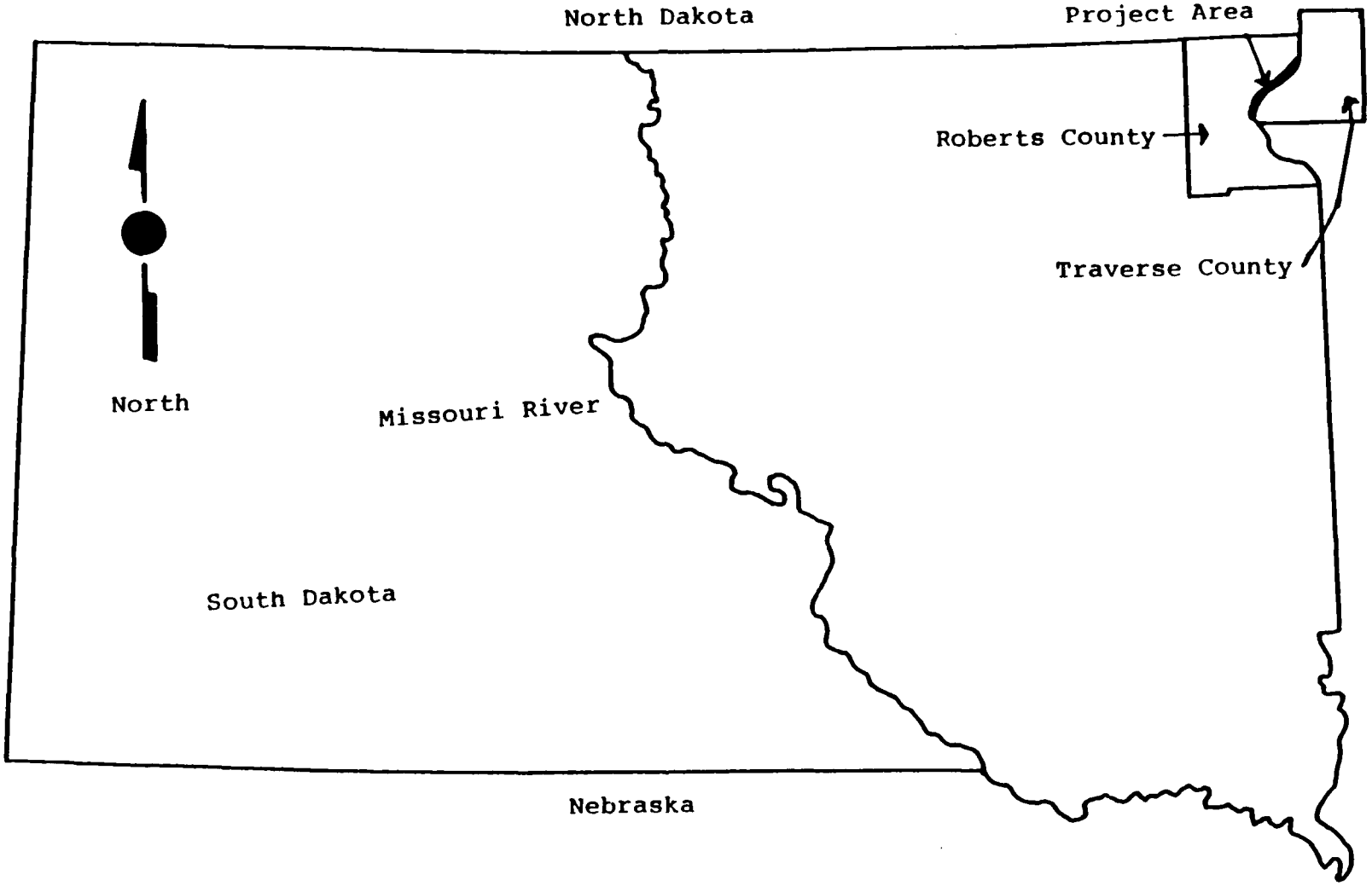


Figure 1. Map showing the location of the project area in South Dakota and Minnesota.

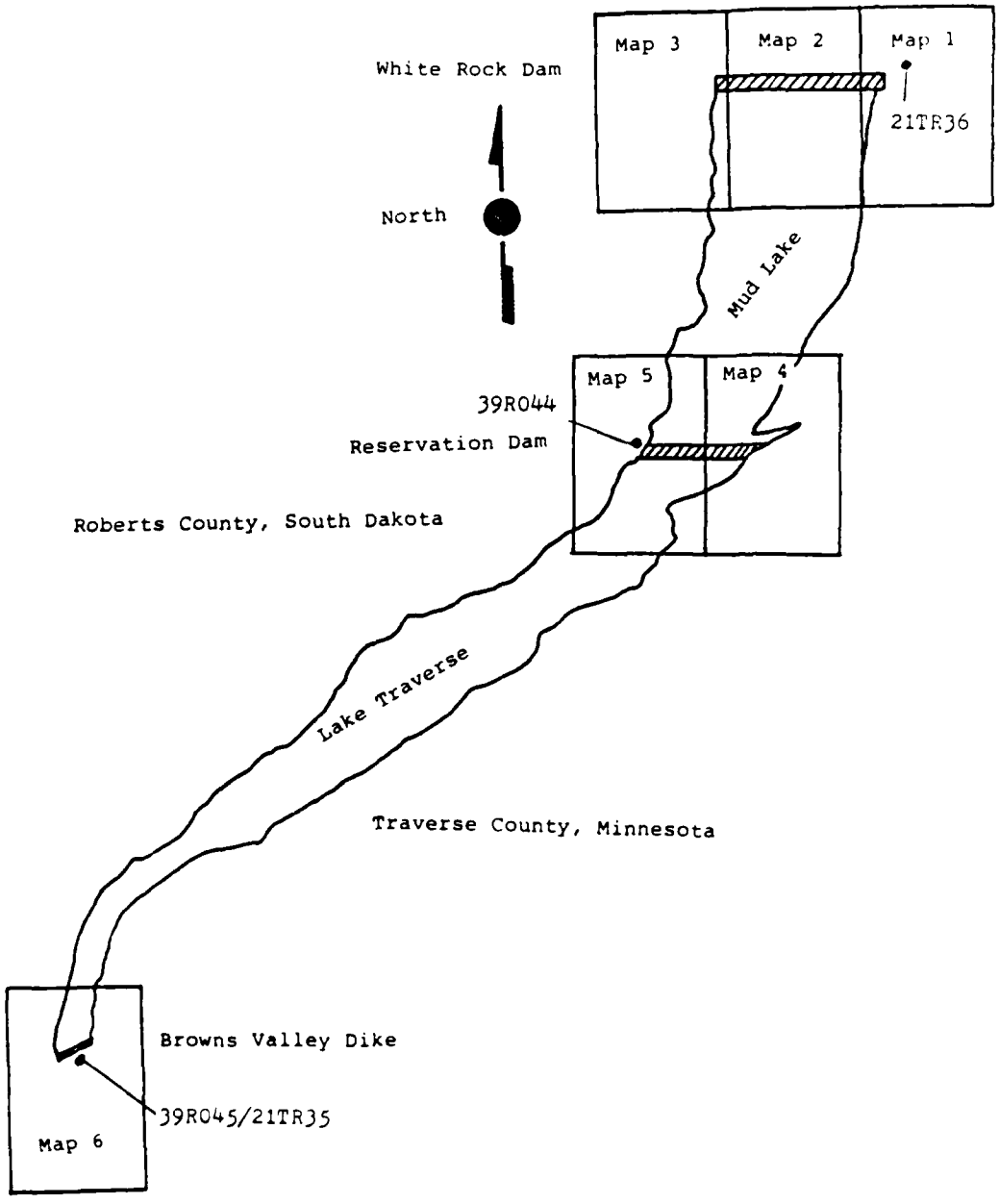


Figure 2. Index map showing the locations of the 7.5 minute project maps, Figures 3 thru 8 (maps 1 thru 6).

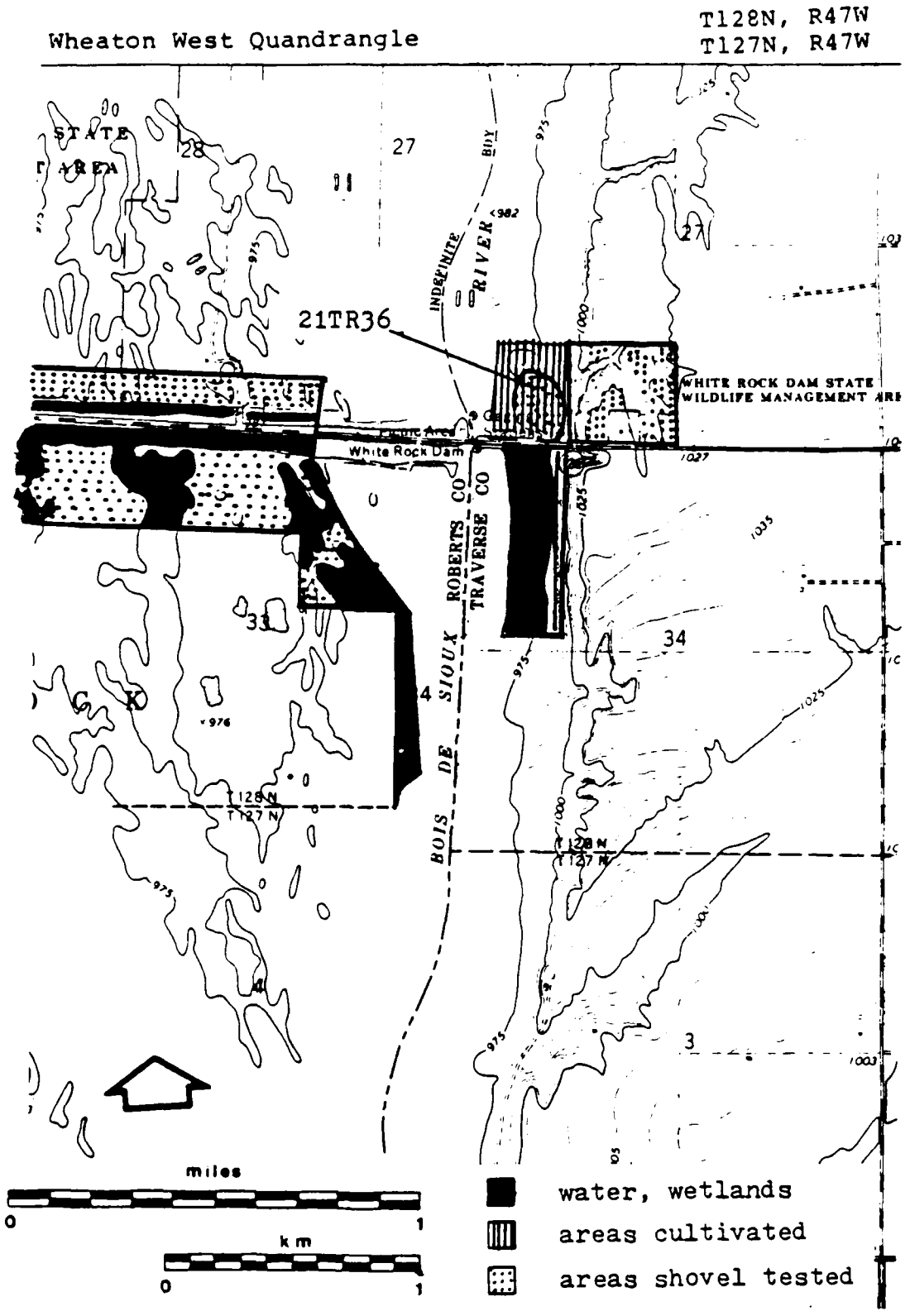


Figure 3. Map 1. Topographic map of the east portion of White Rock Dam and site 21TR36 , Project limits are outlined.

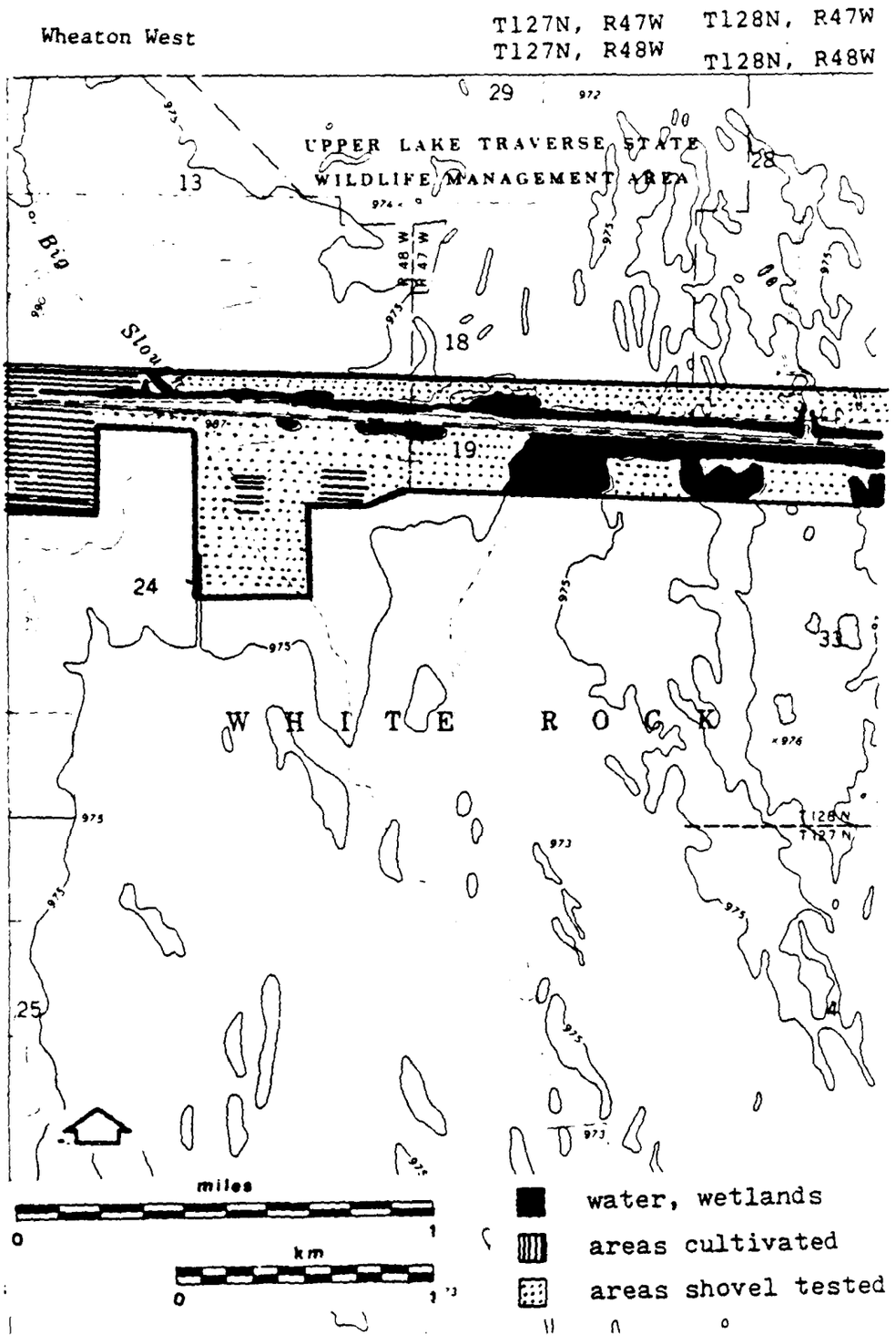


Figure 4. Map 2. Topographic map of the center portion of White Rock Dam. Project limits are outlined.

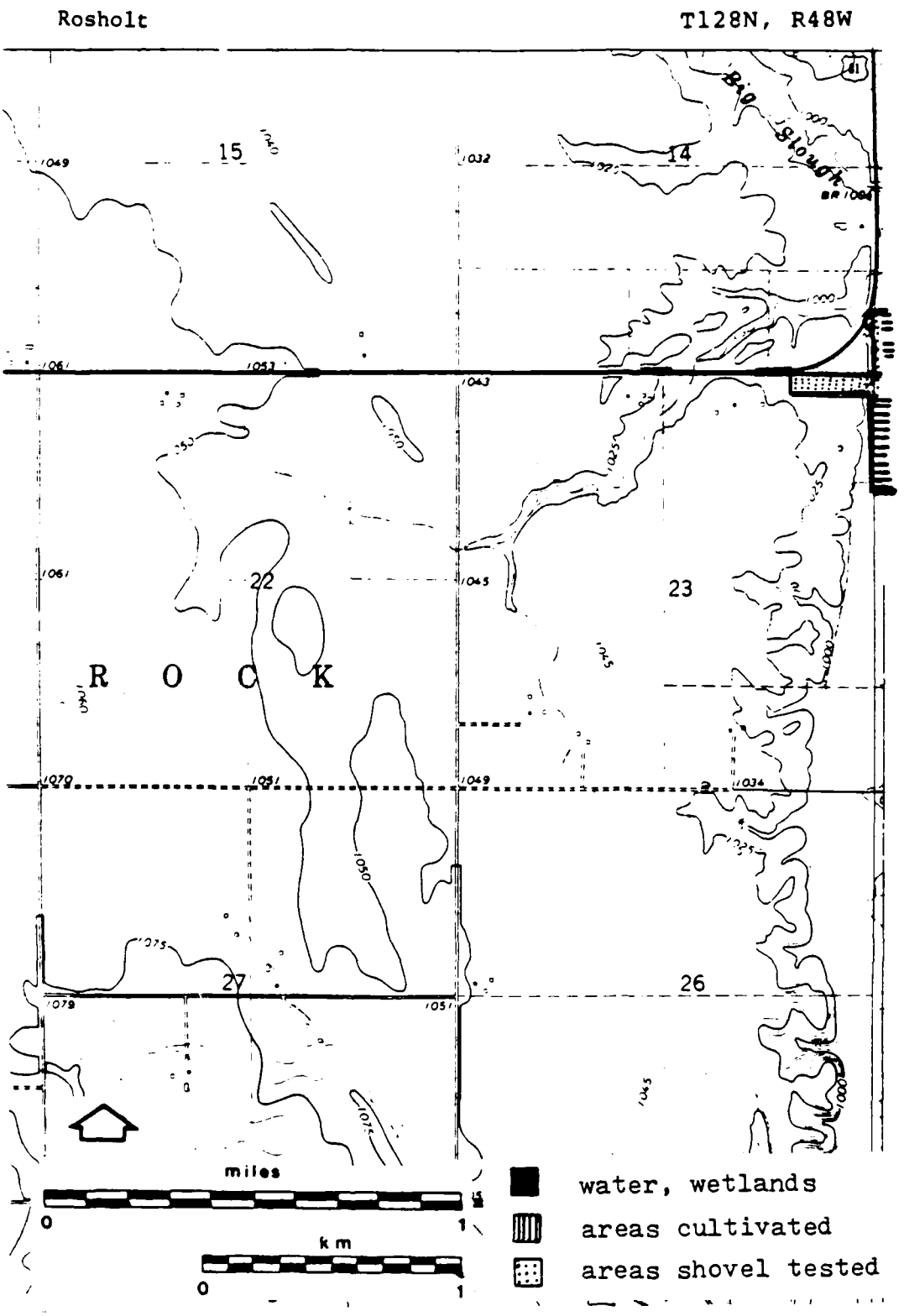


Figure 5. Map 3. Topographic map of the west portion of White Rock Dam. Project limits are outlined.

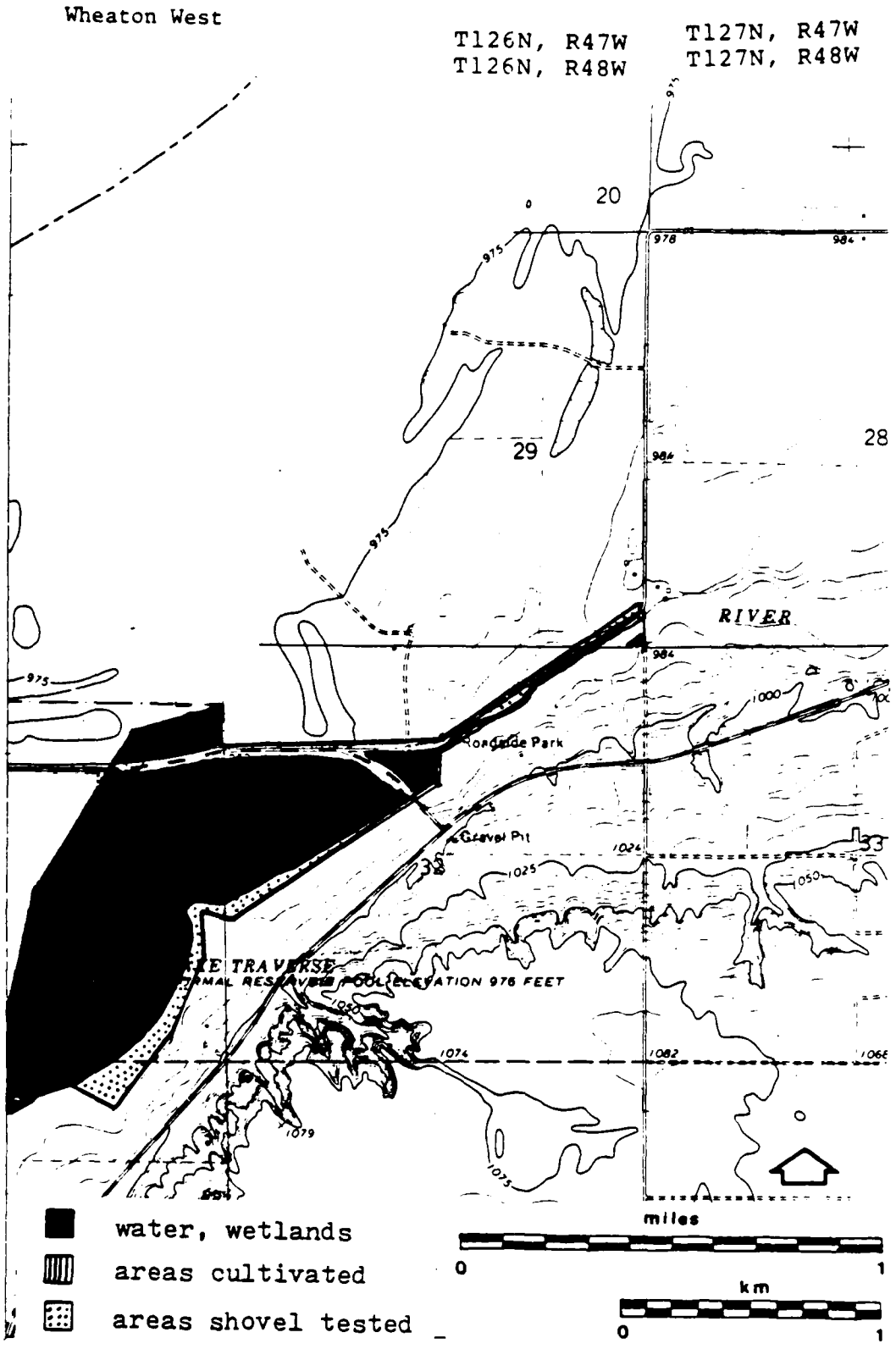


Figure 6. Map 4. Topographic map of the east portion of Reservation Dam. Project limits are outlined.

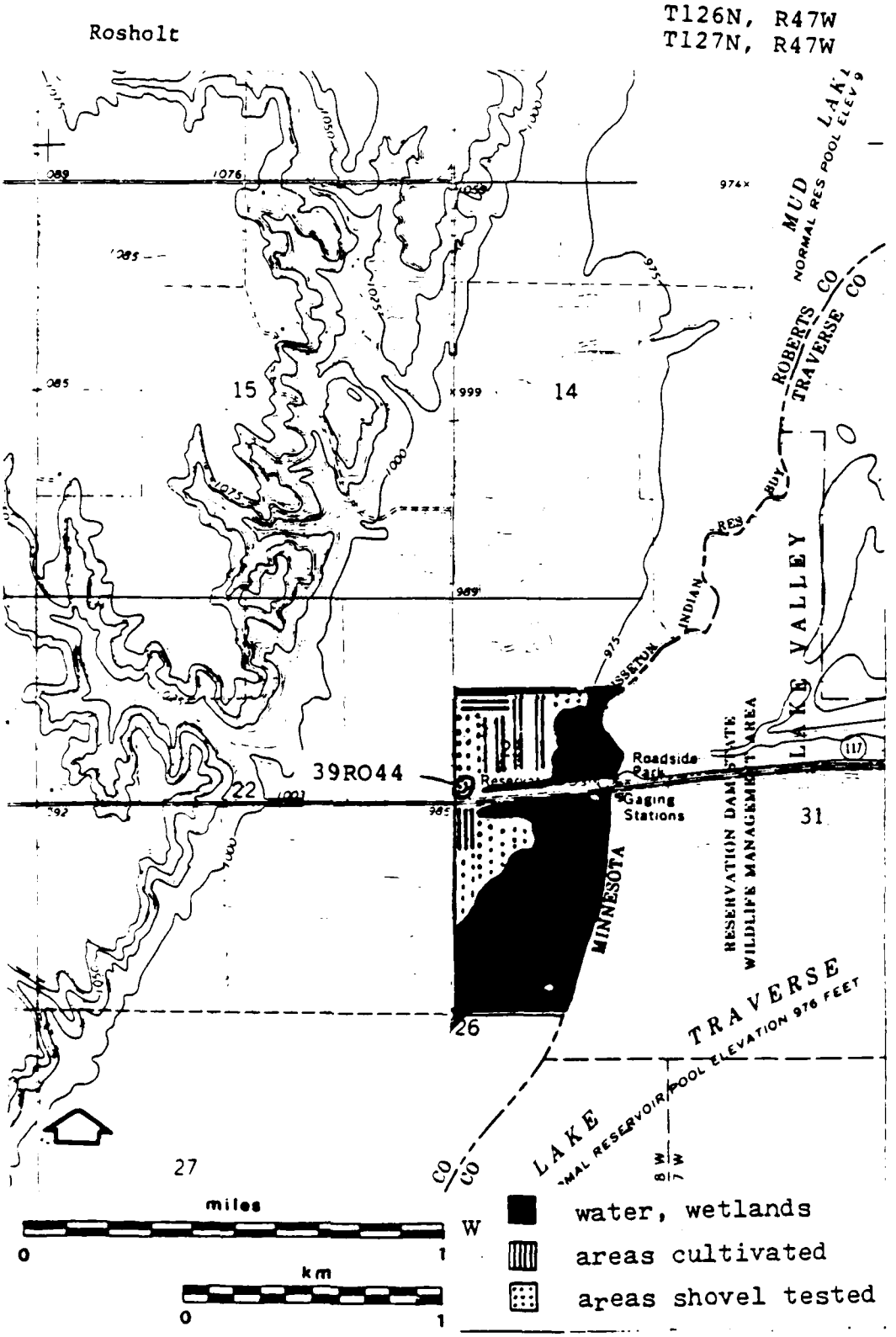


Figure 7. Map 5. Topographic map of the west portion of Reservation Dam. Project limits are outlined.

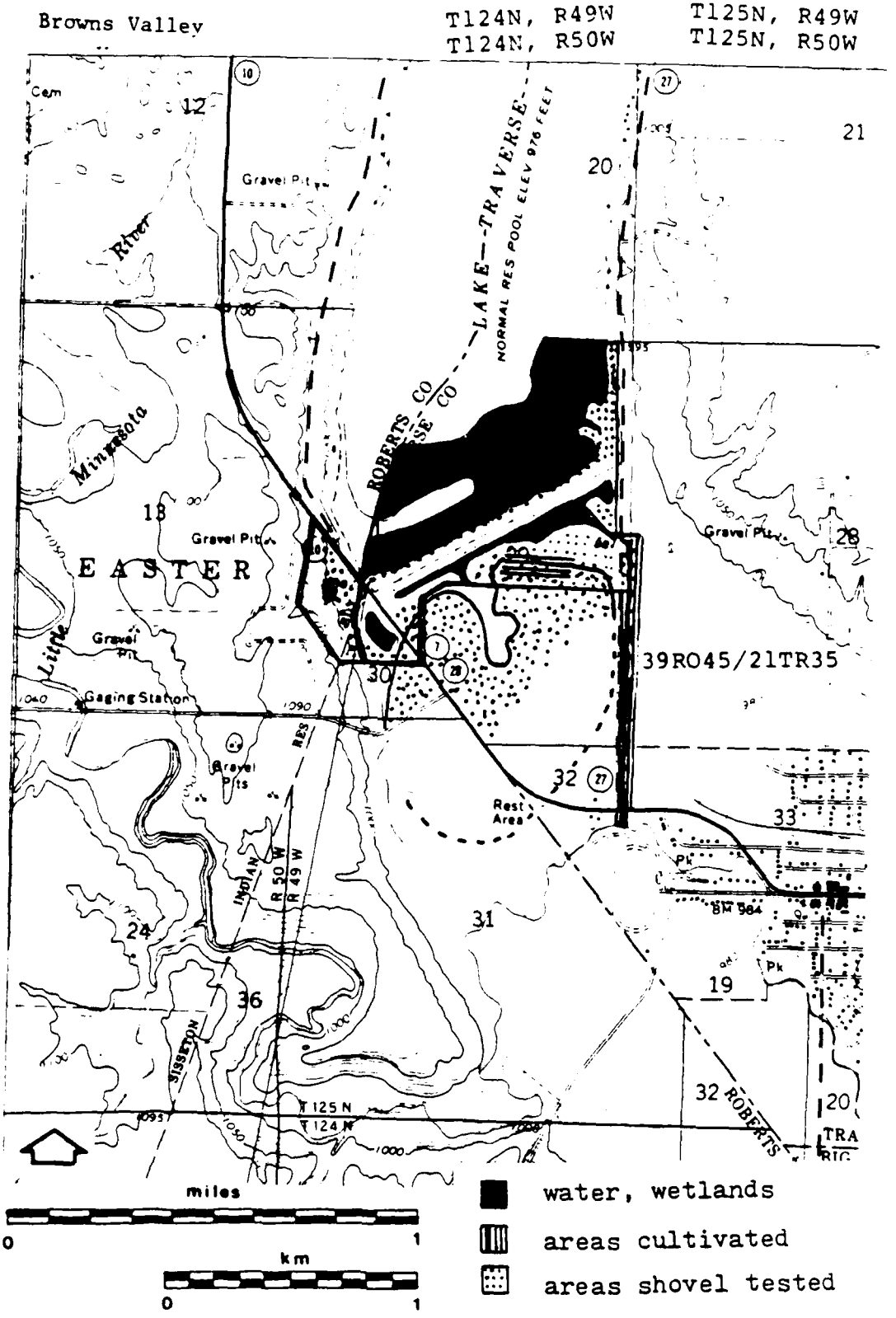


Figure 8. Map 6. Topographic map of the Browns Valley Dike area. Project limits are outlined.

The water level in Lake Traverse is controlled by the Reservation Dam and Browns Valley Dike. The lake stretches approximately 25 kilometers (16.5 miles) from the Reservation Dam to the dike at Browns Valley. The lake averages about two kilometers (1.25 miles) wide. The conservation pool elevation is 297 meters (976 feet) above mean sea level (msl) and encompasses 442 hectares (10,925 acres). Full pool elevation is 299 meters (981 feet) msl.

The water level in Mud Lake is controlled by White Rock Dam. The lake extends about 12 kilometers (7.5 miles) between White Rock and Reservation dams. The conservation pool level is 296 meters (972 feet) msl encompassing 1559 hectares (3,850 acres). Full pool elevation is 299 meters (981 feet) msl with a capacity of 85,500 acre-feet. The total storage capacity for both lakes at 299 meters (981 feet) msl is 137,000 acre-feet.

Lands held in fee title by the U.S. Army Corps of Engineers in the Lake Traverse-Bois de Sioux project total 616 hectares (1,521.9 acres). The fee title lands have six broad types of vegetation: (1) 18 hectares (42 acres, 3 percent) are in agriculture; (2) 180 hectares (443 acres, 29 percent) are in grassland; (3) 173 hectares (425 acres, 28 percent) are in wetlands; (4) 40 hectares (98 acres, 6.5 percent) are in forest; (5) 201 hectares (496.4 acres, 33 percent) are under water; and (6) 4 hectares (7.4 acres, 0.5 percent) are in recreation and residential use (Scope of Work).

Contract Specification

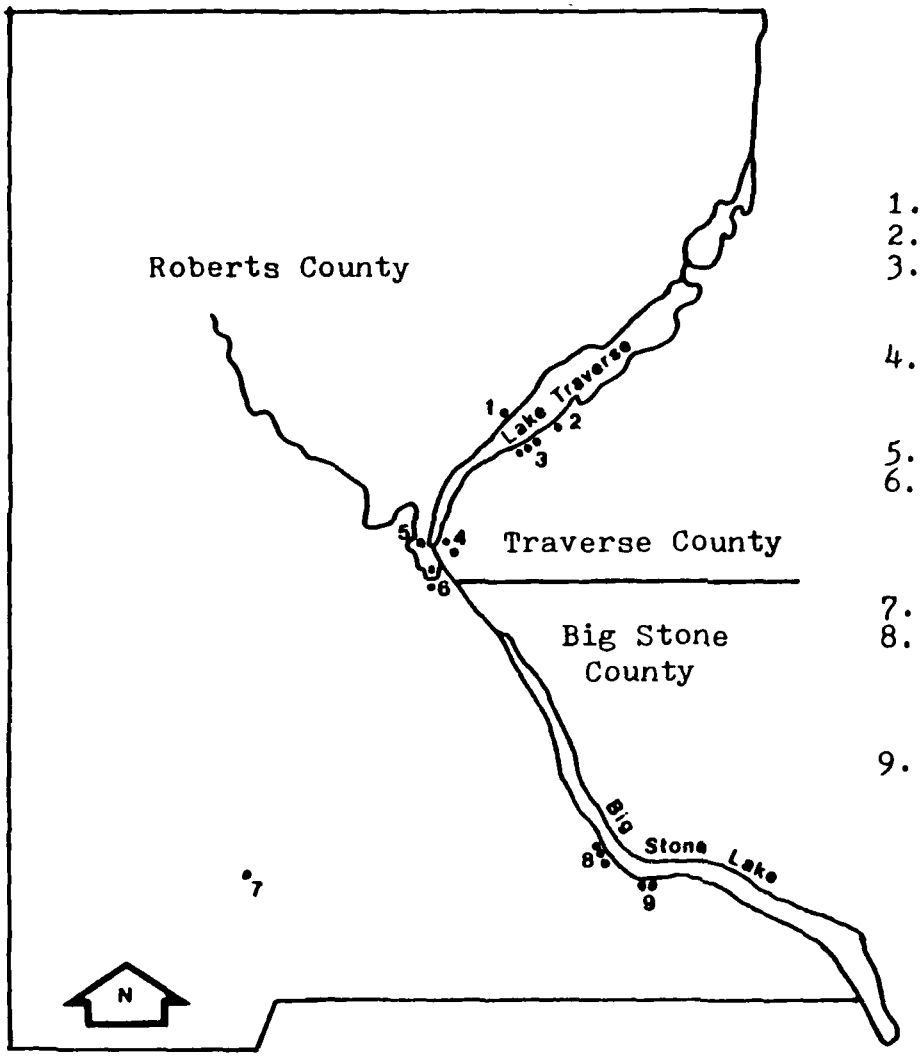
The goal of this contract is to conduct a literature and records search and a Phase II intensive study of 616 hectares (1,521.9 acres) of land held in fee title by the U.S. Army Corps of Engineers at the Lake Traverse-Bois de Sioux project. A 100 percent pedestrian reconnaissance survey of all Corps lands that were not inundated, wetlands or used for recreational purposes was conducted. All discernible archaeological, historical and architectural sites were examined. Each site was minimally tested to determine its potential or probable scientific importance. A detailed Phase III testing and preservation program is developed for the cultural resources that warrant further investigation.

Previous Research

Several archaeological studies have been conducted within Roberts County, South Dakota and Traverse County, Minnesota. The following is a brief summary of those studies for which data are available.

Roberts County

The earliest excavations recorded for Roberts County are of the Dougherty Mounds (39RO1)(Fig. 9) in 1922 and 1923 by W. H. Over. The site consists of eight mounds, of which five



1. Round Mound (21TR1)
2. Kallstrom Mound (39R0301)
3. Wilson Mound Group (21TR2)
   Fire Mound (21TR4)
   Shady Dell (21TR6)
4. K-Mound Group (21TR3)
   Browns Valley Man site (21TR5)
5. Dougherty Mounds (39R01)
6. Buchannan Mound Group (39R03)
   Medberry Mound Group (39R011)
7. Sisseton Mound (39R026)
8. Griner Mounds (39R02)
   Hiawatha Beach Mound (39R06)
   Hunter's Mound (39R07)
9. Hartford Beach Mounds (39R04)
   Hartford Beach Village (39R05)

Figure 9. Map showing the locations of sites in Traverse County, Minnesota and Roberts County, South Dakota, discussed in the text.

were partially excavated. Primary and secondary burials were recovered. One mound yielded extended inhumations with historic artifacts associated with the bodies. Exavations were conducted at the Griner Mounds (39RO2)(Fig. 9) by W. H. Over in the 1920's. Two burials were recovered. One of the burials was a cremation. Excavations were conducted at the Buchannan Mound Group (39RO3)(Fig. 9) by W. H. Over in 1923. The site consists of five mounds. Over partially excavated one mound, which yielded nine bundle burials. Over also conducted excavations at one of the Hartford Beach Mounds (39RO4)(Fig. 9) and at the Hartford Beach Village site (39RO5)(Fig. 9). Excavations at the mounds recovered 14 bundle burials along with a horse skeleton. Some grave goods were associated with the burials (Sigstad and Sigstad 1973a:210-229, 1973b:24-27).

W. H. Over also conducted partial excavations at the Hiawatha Beach Mound (39RO6)(Fig. 9). Several recent casket burials (Dakota?) were found with one flexed primary burial. Excavations at the Hunter's Mound (39RO7)(Fig. 9) recovered three bundle burials. Excavations were conducted at the Medberry Mound Group (39RO11)(Fig. 9) in 1923 by George Schottler (Sigstad and Sigstad 1973a:229-231, 234, 1973b:27). Excavations were conducted at the Kallstrom Mound (39RO301)(Fig. 9) in 1935 by Jenks and Wilford of the University of Minnesota. Eight primary and secondary burials were recovered. The bodies were partly or fully flexed. Few or no cultural objects were associated with the burials (Wilford 1970:22-24).

The Sisseton Mound (39RO26)(Fig. 9) was excavated in 1972 under the supervision of the South Dakota State Archaeologist. A charcoal sample yielded a radiocarbon date of 830±85 B.P. or A.D. 1120±85 (I-7186). Cordmarked pottery from the mound, in addition to the radiocarbon date, indicate a late Woodland construction and use of the mound (Sigstad and Sigstad 1973b).

More recent investigations in Roberts County include surveys of petroglyphs and rock art (Nelson 1973) and a proposed housing site that resulted in locating a fortified village (39RO42)(Fig. 9) on the eastern edge of the Coteau des Prairies (Ruple, personal communication). No excavations were conducted at the site. However, some pottery recovered from the surface indicates a Great Oasis occupation. Additional cultural resource surveys in Roberts County include a survey of proposed housing sites (Boen and Buechler 1977) and a survey of a proposed water treatment plant for the City of Sisseton (Hanenberger 1977). No archaeological or historical sites were found while conducting these small surveys.

Test excavations were conducted at the Hartford Beach Village site (39RO5)(Fig. 9) in 1981. The Hartford Beach Village is unique because it is one of only two fortified

village sites known in the area. It possesses a distinct semicircular fortification ditch that encompasses about 0.4 hectares (1 acre). The ditch is six to eight meters wide and 60 to 80 cm deep. A large bastion is located about halfway along its circumference. Excavations revealed subsurface hearths and post stains. The site yielded ceramics that indicate affiliation with the Initial Middle Missouri variant of the Middle Missouri Tradition. The site is farther northeast than the main concentration of Initial Middle Missouri village sites. Also, it is located adjacent to a large lake (Big Stone Lake) rather than a major tributary as are the other Initial Middle Missouri village sites. There are similarities also to Great Oasis. The Hartford Beach Village is definitely a unique and significant archaeological site (Haug 1981, 1982:24-51).

Traverse County

One of the earliest excavations in Traverse County was conducted in 1933 by Jensen at the site of Browns Valley Man (21TR5)(Fig. 9)(Jenks 1934, 1935, 1937). Browns Valley Man has been dated to approximately 6,000 B.C. The site, located in a gravel quarry, was subsequently destroyed. Excavations were conducted in 1934 at the Round Mound (21TR1), Wilson Mound Group (21TR2), K-Mound Group (21TR3), and Fire Mound (21TR4)(Fig. 9) by personnel from the University of Minnesota. Excavations at Fire Mound (21TR4) recovered three badly deteriorated bundle burials. A few artifacts were associated with the burials (Memo on Traverse County; Wilford, Johnson and Vicinus 1969:45-46; Wilford 1970).

More recent investigations in Traverse County include the excavation of a trench across a ditch at the Shady Dell site (21TR6)(Fig. 9) in 1952. In 1953, test excavations were conducted at three sites on Jensen's Island and at a site on the Zacharias farm (Memo on Traverse County). The most recent archaeological investigation in Traverse County was a survey of the Dome Pipeline Corporation's proposed pipeline right-of-way. Six sites were located along the right-of-way in Traverse County. One site consists of a circular depression with associated lithics and five sites are lithic scatters (Lane 1974:18-23).

In summary, most of the archaeological investigations, that have been conducted in Roberts County, South Dakota and Traverse County, Minnesota, have been associated with burial mounds. This has provided a very biased view of the potential archaeological resources that occur in the region. Future investigations need to focus upon sites such as the Hartford Beach Village (39R05) which will provide invaluable information for developing a better understanding of the region's prehistory.

Level of Effort

Investigations during the project were conducted over a

period of six months. Field work was conducted in October and November, 1982, by a team of two archaeologists, Kenneth L. Brown and Marie E. Brown. Dennis Beissel, a geomorphologist, conducted field inspections during the first week of November, 1982. The historian, Barbara Biggs, conducted records and literature searches during March and April, 1983. A draft of the report of findings was submitted to the Corps of Engineers the second week of May, 1983.

The amount of human effort directed toward the completion of this project amounts to greater than 116 person-days (928 person-hours). This level of effort can be divided into the field work, laboratory analysis, and report writing. The figures in Table 1 show the person-days devoted toward each phase of the project.

Table 1

Level of Effort

		Person-days
Field Work		
Archaeologists		10
Geomorphologist		3
Historian		14
	Sub-Total	27
Laboratory Work		
Archaeologists		15
Historian		20
	Sub-Total	35
Report Preparation		
Archaeologists		20
Geomorphologist		2
Historian		17
Revisions to draft report		15
	Sub-Total	54
	GRAND TOTAL	116

CHAPTER 2

Environmental Background

Introduction

The project area is located within the Minnesota River-Red River lowland and includes portions of land around Lake Traverse and Mud Lake, within the Bois de Sioux and Red River of the North drainages, in two counties, Traverse County in southwestern Minnesota and Roberts County in northeastern South Dakota. All surveyed property is within the former channel of Glacial River Warren which served as the southern outlet for Lake Agassiz during the waning stages of Late Wisconsinan glaciation. Lake Traverse and Mud Lake extend north through the Big Stone Moraine to the Lake Agassiz lowland (Wright 1972).

The sides of the former outlet consist of narrow terraces left from former stages of Lake Agassiz. The terraces abut the valley walls which are cut through moraine topography. The morainic uplands are composed primarily of glacial till with outwash deposits of sand and gravel interspersed throughout the length of the study area. Weathering erosion has smoothed valley side slopes as has accumulation of colluvial deposits on terraces. Erosion has intensified due to cultural activity in the last 100 years.

Minnesota River-Red River Lowland

The Minnesota River-Red River lowland is a "broad depression drained southeastward by the Minnesota River and northward by the Red River" (Flint 1955:5). It is at least 80 kilometers (50 miles) wide. Although most of it is situated in Minnesota and North Dakota, it does include extreme northeastern South Dakota. "It is believed to have been excavated by a large northward-flowing stream and subsequently enlarged by glacial erosion" (Flint 1955:5). This area was formerly covered by the southern portion of Glacial Lake Agassiz. Near the point where South Dakota, North Dakota and Minnesota meet, the southern portion of the lake floor narrows into a steep-sided, 30 meter (100 feet) deep trench ranging from less than one kilometer (0.4 miles) to more than 3.2 kilometers (2 miles) wide. This trench is the spillway channel carved by Glacial River Warren which carried overflow from Lake Agassiz southeastward. The northern part of this trench, midway between Big Stone Lake and Lake Traverse, is the divide between drainage to the Gulf of Mexico and drainage to the Arctic Ocean (Flint 1955:5-6).

The lowland is thoroughly covered with glacial drift. Bedrock is infrequently exposed in the sides of steep-walled valleys. The topography varies from nearly flat to undulating or slightly rolling. The average local relief is less than six meters (19 feet). The surface consists of ground moraine

merging into barely perceptible end moraine ridges.

Glacial Lake Agassiz and Glacial History

Nearly all of Traverse County and the northeast corner of Roberts County is situated on the bed of Glacial Lake Agassiz which was the most extensive of the glacial Great Lakes. It was larger, when at its maximum extent, than the present Great Lakes combined (Fig. 10). Lake Agassiz occupied the basin of the Red River of the North and a wide region to the north. All surveyed project areas are within the former channel of Glacial River Warren which served as the southern outlet for Lake Agassiz during the waning stages of Late Wisconsinan glaciation.

Lake Traverse (and Mud Lake) extends north through the Big Stone Moraine to the Lake Agassiz lowland (Wright 1972). Late Wisconsinan age Des Moines lobe ice retreated northward from the Big Stone Moraine at about 10,000 B.C. Meltwater was ponded between the ice front and the moraine forming Glacial Lake Agassiz which eventually covered approximately 518,000 square kilometers (200,000 square miles) (Matsch, Rutford, Tipton 1972). The outlet for Lake Agassiz became established at Browns Valley. Boulders derived from the dissected Big Stone Moraine paved the outlet channel and temporarily halted downcutting. Stabilization of the lake at this level resulted in the formation of Herman Beach (elevation 323 meters, or 1060 feet msl in the outlet area). Drainage during the Herman stage was through Cottonwood Slough and Lake Traverse (Wright 1972). Withdrawal of Lake Agassiz from the Herman Beach level occurred at approximately 9,700 B.C. (Wright 1972).

When the Herman stage boulder pavement was breached in the outlet channel, downcutting occurred until another pavement was formed at the Norcross level (317 meters, or 1040 feet msl in the outlet area). The process was repeated through the Tintah (311 meters, or 1020 feet msl) and Campbell (299 meters, or 980 feet msl) stages until abandonment of the southern outlet (River Warren) at about 7,200 B.C. (Wright 1972).

After termination of River Warren, its successor, the Minnesota River did not have the discharge necessary to transport the sediment load produced by tributary streams. The tributaries then formed alluvial fans near their confluence with the Minnesota River. The alluvial fans dammed the river which was segmented into several narrow lakes (Wright 1972). The alluvial fan of the Little Minnesota River formed Lake Traverse and is now the continental divide.

The glacial and related landforms have been little altered since 7,000 B.C. although many kettle holes and sloughs have been filled in. The thickness of post-glacial sediment in Lake Traverse has not been determined.

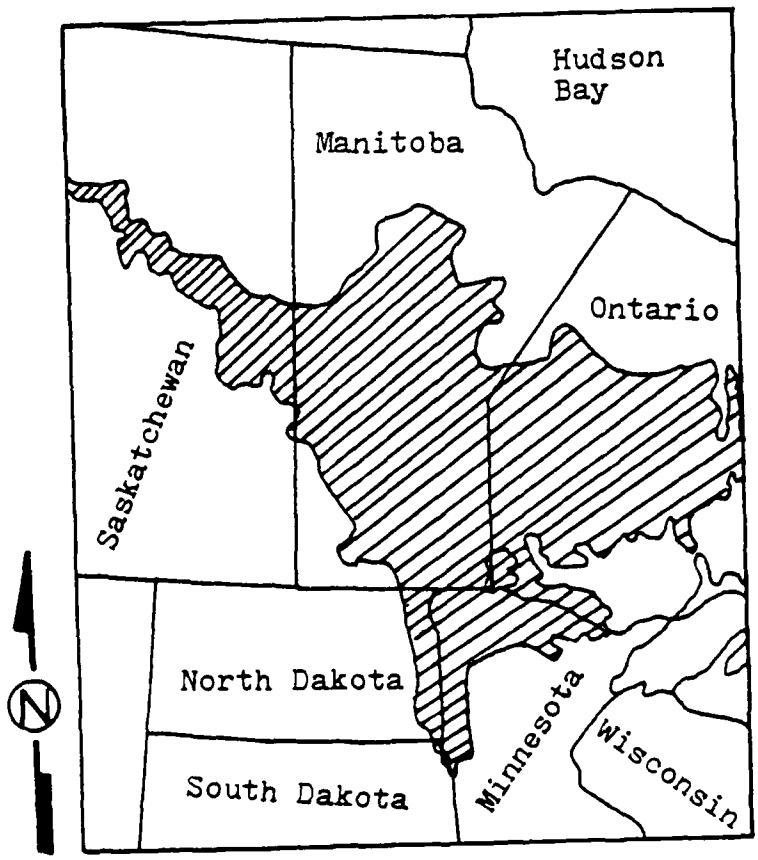


Figure 10. Map showing the maximum extent of Glacial Lake Agassiz.

Lake Traverse

Lake Traverse, forming a portion of the boundary between South Dakota and Minnesota, is situated in the former valley of Glacial River Warren. It was formed by the alluvial fan of the Little Minnesota River (Bray 1977:63). This fan is now the continental divide between the Hudson Bay and Mississippi watersheds. Lake Traverse is the headwaters (primarily) of the Bois de Sioux River, a major source of the Red River of the North and is used for flood control and water conservation. Prior to the completion of the Lake Traverse-Bois de Sioux flood control project in 1941, the lake consisted of two basins totalling approximately 40 kilometers (25 miles) long and averaging about 2.4 kilometers (1.5 miles) wide. The upper basin was 30 kilometers (19 miles) long and the lower basin was 9.6 kilometers (6 miles) long (Shunk 1909). Upon the completion of the flood control project, the lower basin became part of Mud Lake formed by the impounding of water between White Rock and Reservation Highway dams, both of rolled earth-fill construction. Mud Lake is about 12 kilometers (7.5 miles) long. It has a conservation pool level of 296 meters (972.0 feet) msl and a full pool elevation of 299 meters (981.0 feet) msl. The former upper basin is contained within the present Lake Traverse, formed by the impounding of water between the dike at Browns Valley and Reservation Highway Dam. The lake is about 27 kilometers (16.5 miles) long and averages about two kilometers (1.25 miles) wide. It has a conservation pool elevation of 297 meters (976.0 feet) msl and a full pool elevation of 299 meters (981.0 feet) msl (Scope of Work:2).

Prior to construction of the dike and dams, Lake Traverse was subject to great fluctuations in its depth at times being high enough to allow passage of canoes from Big Stone Lake to Lake Traverse (e.g., Bray and Bray 1976; Kane et al. 1978:307; Shuman 1936). During early September, 1934, the lake contained about 0.3 meter (1 foot) of water. By early November, 1934, it was completely dry. It had begun to refill by December, 1935 (Shuman 1936:302-303). The fluctuating lake levels were the result of rainfall and evaporation. "Evaporation is dependent upon temperature, wind velocity, humidity, and other factors. When rainfall gradually decreases at the same time that temperature is increasing, the result is the lowering of a lake's level, ..."(Shuman 1936:307). Construction of the dike and dams has helped to stabilize the levels of Lake Traverse and Mud Lake.

Soils

The soils in Roberts County, South Dakota have been classified and mapped (Miller, Koopman, and Glover 1977). The soils of Traverse County, Minnesota, have not yet been mapped. Two sites located during this project have been determined to occur on three soil types in Roberts County. One site, 21TR36, located in Traverse County, Minnesota, has not been determined as to its soil association. The three

soil types on which sites within the project area occur are Glyndon silt clay loam with 0 to 3 percent slopes (GyA), LaDelle silt loam with 0 to 2 percent slopes (La), and Playmoor silty clay loam with 0 to 2 percent slopes (Pm).

The Glyndon soil series is characterized by a high content of lime that causes this soil to blow easily. It has moderate permeability associated with a high water table. The Playmoor soil series consists of deep, poorly drained, nearly level, silty soils that formed in alluvium and are on bottomlands. They have moderately slow permeability associated with a seasonal high water table. The LaDelle soil series consists of deep, nearly level, moderately well drained, silty soils on bottom lands and low terraces. The soils formed in alluvium. The native vegetation for the three soil types is mostly tall prairie grasses (Miller, Koopman, and Glover 1977).

Climate

The climate of the project area is classified as a sub-humid continental climate characterized by long, cold winters and hot summers. Bodies of water and topography have some effect on the climate of Roberts and Traverse counties. Lake Traverse and Big Stone Lake extend along the eastern boundary of Roberts County, South Dakota and the western boundary of Traverse and Big Stone counties, Minnesota. In places the lakes have a moderating effect on the temperature.

The climatic data for Roberts County is based on 37 years of weather records taken at or near Sisseton, South Dakota, at an elevation of 366 meters (1,200 feet) msl (Miller, Koopman, and Glover 1977). Temperatures have a large variation annually. Summer temperatures generally rise to 38 degrees Celsius (100 degrees Fahrenheit) or more and drop to -30 degrees Celsius (-20 degrees Fahrenheit) or colder during the winter. A temperature of -18 degrees Celsius (0 degrees Fahrenheit) can be expected to occur on the average of about 40 days per year. The average frost-free days extend from May 11 to September 28, or about 140 days.

The average annual precipitation at Sisseton is 55 cm (21.8 inches) with 43 cm (17 inches), or about 78 percent falling during the growing season. Thunderstorms are the main source of precipitation during the growing season. Hail sometimes accompanies the thunderstorms. The seasonal snowfall in Sisseton averages 84 cm (33 inches), but has varied from 25 cm to 180 cm (10 inches to 71 inches). Strong winds accompanying the snowfall cause large drifts.

Wind speed averages 17.6 kilometers (11 miles) per hour and the prevailing direction is from the south during the summer and from the northwest during the winter. Relative humidity averages 85 percent in early morning to 50 percent in the afternoon during the summer and from about 80 percent in the early morning to 65 percent in the afternoon during

the winter. Average annual lake evaporation is about 81 cm (32 inches). The National Weather Service class A pan evaporation is about 112 cm (44 inches), with about 102 cm (40 inches), or 84 percent evaporating from May through October (Miller, Koopman, and Glover 1977).

Past Climates

The reconstruction of past environments in a region is complex. One source used by archaeologists is the paleoenvironmental record preserved at sites. This is a reliable method since floral and faunal remains are usually directly related to the prehistoric environment. However, this method is dependent upon the recovery of sensitive environmental indicators, such as pollen or gastropods. Fortunately, an environmental reconstruction based on an analysis of pollen, seeds and mollusks recovered from a sediment core is available for Pickerel Lake, Day County, South Dakota (Watts and Bright 1968). Although Pickerel Lake is located southwest of the present study area, the environmental sequence obtained for the lake area may have some applicability to the present study area due to the close proximity of the areas. Also, several pollen cores and macrofossils have been recovered from other sites within the Glacial Lake Agassiz region that provide a data base for a detailed reconstruction of past floristic changes in the project region (Shay 1967).

Pickerel Lake formed on the Coteau des Prairies prior to 8720±140 B.C. Fossil pollen, spores, seeds and mollusks recovered from a core from the lake were used to reconstruct the vegetational history of the nearby upland and the limnological history of the lake (Watts and Bright 1968). The following environmental sequence was obtained from the analyses: (1) Prior to 8720 B.C., the climate was cool and moist. A boreal forest existed around the lake and on the nearby upland. A few marshes occurred around the lake margin. (2) Between 8720 and about 6050 B.C., the climate was warmer. A mixed deciduous forest occurred around the lake, in gullies and on the upland, but the tree cover on the upland was less dense and had numerous prairie-like openings. (3) Between approximately 6050 and 2050 B.C., the climate was warm, with recurring summer drought. The upland was dominated by bluestem prairie. The deciduous forest was nearly absent, except for a few groves around the lake and/or in gullies. "Reed marshes were common around the lake margin, and during low water levels a rich herbaceous vegetation invaded the exposed lake sediments" (Watts and Bright 1968:855). (4) Since approximately 2050 B.C., the climate has been warm, but with more summer precipitation than during the preceding period. The upland and lake vegetation has been about the same as now. Prairie dominates the upland and oak and ash deciduous forest is common around lakes and gullies. Reed marshes occur around the lake margin (Watts and Bright 1968).

It has been postulated that major environmental events occurred at approximately 7190 B.C., 6500 B.C., 4030 B.C.,

2730 B.C., 940 B.C., A.D. 260, A.D. 1190, A.D. 1550, and A.D. 1850 (Bryson, Baerreis, and Wendland 1970:63). The dates of significant environmental change were derived by analysis of radiocarbon dates in ten volumes of Radiocarbon (1959-1968).

Selecting only those dates thought to be significant by the person who wrote the sample description, and which also indicated geologic discontinuities, the number of radiocarbon dates to be analyzed was reduced to 620. The frequency with which the 620 radiocarbon dates fell within each two centuries of the last 10,000 years was counted and subjected to a least-square computer fit of the normal distribution to actual radiocarbon dates. Results showed the radiocarbon dates tended to cluster into the nine major times of discontinuity listed above. These nine major times of discontinuity represent an objective consensus of the times at which major environmental changes occurred (Table 2) (Bryson, Baerreis, and Wendland 1970:53-54).

Analysis of the radiocarbon dates was used to construct a postulated "step-like" succession of post-glacial climatic episodes. This climatic model replaced the simpler model of Ernst Antevs (1955) that postulated a gradual rise in post-glacial temperatures followed by a gradual fall in temperatures.

The climatic model is based partially upon the Blytt-Sernander system widely used in Europe. Climatologists well know that the earth's atmosphere acts as a unit, and a major change in Europe cannot occur without a concurrent change in North America. The results of the changes are usually different. Analysis of radiocarbon dates and bog stratigraphy from Europe correlates with climatic changes in North America, even though the effects of the climatic changes were different. It is assumed that the atmosphere operated in a similar synchronous manner in the past (Bryson and Wendland 1967).

Before describing postulated climatic conditions for the defined climatic episodes and their effect on the project area's floristic characteristics, a few terms and concepts need to be explained. The current climate in the Plains is determined by three major air masses: (1) the Maritime Tropical which originates in the American tropics and the Gulf of Mexico; (2) the Mild Pacific which originates in the Pacific Ocean; and (3) the cold Arctic which originates at the Arctic Circle. It is the interaction of these three air masses that determines temperatures and precipitation of regions within the Plains (Bryson and Wendland 1967:274).

The warm Maritime Tropical air carries with it a large quantity of moisture. The cold Arctic air carries little moisture, but when it comes into contact with the warm, moist, Tropical air, precipitation occurs at the juncture of these two opposing air masses. The Mild Pacific air mass can

TABLE 2

Past Climatic Episodes Postulated by Various Authors

Beginning Dates for Post Glacial Climatic Episodes

Climatic Episode		Baerreis Bryson 1965	Bryson Wendland 1967	Bryson Baerreis Wendland 1970	Wendland Bryson 1974	Composite
Recent		A.D. 1880	A.D. 1850			A.D. 1850
Neo-Boreal		A.D. 1550	A.D. 1550			A.D. 1550
Pacific	II	A.D. 1450	A.D. 1450			A.D. 1450
	I	A.D. 1250	A.D. 1200	A.D. 1190	A.D. 1100	A.D. 1100
Neo-Atlantic		A.D. 800-900	A.D. 900			A.D. 900
Scandic		A.D. 300-400	A.D. 400	A.D. 260	A.D. 270	A.D. 270
Sub-Atlantic		500-600 B.C.	550 B.C.	940 B.C.	810 B.C.	810 B.C.
Sub-Boreal	III				1620 B.C.	1620 B.C.
	II				2290 B.C.	2290 B.C.
	I			2730 B.C.	3110 B.C.	3110 B.C.
Atlantic	IV			4030 B.C.	4100 B.C.	4100 B.C.
	III			5100 B.C.	4960 B.C.	4960 B.C.
	II			5780 B.C.	5790 B.C.	5790 B.C.
	I			6500 B.C.	6540 B.C.	6540 B.C.
Boreal	II			7190 B.C.		7190 B.C.
	I			7700 B.C.	7350 B.C.	7350 B.C.
Pre-Boreal				ca. 8550 B.C.	8080 B.C.	8080 B.C.

be explained in terms of western topographic features. The western mountains are generally too high to allow the moist, warm Pacific air to cross them. Instead, there are three dominant routes by which the Pacific air crosses the mountains. These three passages are the least difficult routes to cross through the mountains. The southern route is through what is approximately the border of the United States and Mexico. This route carries the greatest flow of Pacific air during the winter when the westerlies are far south. This air crosses southern California and Arizona into the southern Plains, known as the Llano Estacado. This air is seasonally warm and very dry as it descends down the east slope of the mountains (Bryson 1980).

The central air route follows the Columbia River Valley along the border between Oregon and Washington, the Snake River in southern Idaho, and through the basins in Wyoming. This air is mild and dry and drives a wedge between the Arctic and Tropical air masses as it enters the northern and central Plains. This dry air coincides with the most easterly extension of the grasslands into Ohio and Pennsylvania (Bryson 1980).

The northern Pacific air route has no broad passes through the Canadian mountains through which to flow. Rather, a vertical movement of the air occurs over the mountains. This air is mild and dry. The broad Mississippi Valley system allows unimpeded flow for the Arctic and Tropical air masses. The Pacific air drives a wedge, composed of the three varieties of westerlies, between the Arctic and Tropical air masses. The seasonal dominance and interaction of these five air-flows determines the distribution of plants and animals within the Plains and is the determinant of climatic change (Bryson 1980).

The following are brief descriptions of what the climates and floristic characteristics may have been like during each of the major climatic episodes postulated by Bryson and Wendland (1967) and Shay (1967). Past climates cannot be described in detail; however, applying modern mean patterns of airstreams and frontal boundaries to the modern distribution of biota, generalized reconstructions of past climatic and vegetational patterns can be made. These changes had an effect on the use of the floral and faunal resources of the region by prehistoric peoples.

Late Glacial Climatic Pattern (10,000 to 8,000 B.C.)

The eastern half of North Dakota was covered by the Laurentide ice sheet of the Wisconsin glaciation at 14,000 B.C. The ice sheet was retreating by 10,000 B.C. to 8,500 B.C. in North Dakota and Minnesota. At this time, as the ice sheet retreated, the boreal forest biota became dominant. The boreal forest extended south into most of Nebraska (Bryson and Wendland 1967:281). The southern edge of the Arctic air mass in winter was tangent to the eastern face of the Rocky

Mountains, ran south of the Sand Hills of Nebraska and just north of the Dismal Swamp in Virginia. The northern edge of tropical air in summer would have been tangent to the mountains of eastern Mexico, north to southwestern Kansas and then east through central Pennsylvania. The summer position of the Arctic air mass was probably along the frontal edge of the glacier. The Pacific air mass and westerlies should have been strong in the summer, pushing through northern Illinois, Indiana, Ohio and Pennsylvania.

The winter air entering the Lake Traverse area would have been as warm as the present, with air entering from the west and south. Arctic air should have brought less cloud cover and very low relative humidity. The somewhat warmer, drier, clear air in winter and strong westerlies in summer should have made droughts more frequent (Bryson and Wendland 1967).

At about 10,050 B.C. Lake Agassiz I formed when the Des Moines Lobe in the basin retreated. The pollen record is dominated by *Picea* (spruce)(60 to 80 percent) with varying amounts of trees and shrubs. Herb pollen compose less than 20 percent of the pollen sum. Macrofossils from the area include needles and seeds of *Picea* (spruce) and *Larix laricina* (larch). As the lake water fell, new habitats became available with vegetational trends favoring the expansion of tree vegetation (Shay 1967:243-244). The project lands at this time would have been the river bed of Glacial River Warren.

Pre-Boreal and Boreal Climatic Pattern (8,000 to 6,500 B.C.)

Pollen diagrams indicate an abrupt transition from Late Glacial to Post-Glacial pollen assemblages, indicating an abrupt change in the circulation patterns of the major air masses. The collapse of the Late Glacial boreal forest biota occurred about 8,500 B.C. and was replaced by grassland in the central and northern Plains and by jack-pine and red pine forests in northeastern Minnesota and Wisconsin. Some Arctic air must have flowed south during the winter, but strong summer westerlies must have prevailed across North America in the mid-latitudes, extending the drier grassland climate far eastward. The grassland biota existed in close proximity to the glacial ice front (Bryson and Wendland 1967).

Glacial Lake Agassiz had a low water stage that ended approximately 8,000 B.C., and the water level rose to the Campbell strandline until about 7,000 B.C. This time period, 8,000 to 6,500 B.C., is characterized by maxima of *Pinus* (pine) and deciduous tree pollen. The abrupt decline in the frequency of *Picea* (spruce) is accompanied by increases in *Betula* (birch), *Populus* (poplar and aspen), *Ulmus* (elm), *Pinus* (pine), and *Quercus* (oak). Macrofossils of trees and shrubs include *Picea* (spruce) and *Larix* (larch) needles. The interpretation of these differences in *Pinus* (pine), *Betula* (birch) and *Quercus* (oak) pollen is that they are producers

of large amounts of pollen that can be dispersed easily over a large area. Peak pollen frequencies for *Pinus* (pine) are lowest (20 percent) at Pickerel Lake while *Betula* (birch) and *Ulmus* (elm) maxima are over 20 percent and *Quercus* (oak) peaks at about 15 percent. Prairie openings expanded rapidly on lowlands adjacent to Glacial Lake Agassiz at 6,500 B.C. (Shay 1967:245-246). This rapid change from boreal forest to grassland could not have been without significant impact on the Big Game hunters of the region. Exactly what the impacts were are not known at this time, since few Paleo-Indian sites have been systematically investigated in the Lake Agassiz Plains. The Corps land at Lake Traverse would have been the bed of Glacial River Warren at this time.

Atlantic Climatic Pattern (6,500 to 3,100 B.C.)

Rapid wasting of the glacier ice occurred after 6,000 B.C. The forests extended northward as fast as the ice disappeared. There is no evidence for a tundra or treeless area between the ice and forest. The Pacific air that characterizes the grassland climate expanded northeastward into central Minnesota and towards the Atlantic Ocean (Bryson and Wendland 1967:291).

Glacial Lake Agassiz completely drained into Hudson Bay before 5,350 B.C. Herb pollen frequencies rise during this period, particularly Gramineae, *Artemisia*, and *Ambrosia*. *Quercus* (oak) is dominant in the eastern areas in present pine-hardwood and deciduous forests. Using modern analogs, this can be interpreted as indicating prairie and oak savanna. *Ambrosia* pollen reached its maxima at about 6,000 to 5,000 B.C. suggesting a period of maximum aridity. Species of *Ambrosia* and *Chenopodium* possibly colonized the newly exposed Glacial Lake Agassiz lakebed. For the project area it is inferred that marsh vegetation developed in areas of impeded drainage while prairie spread over better drained sites (Shay 1967:247).

It is postulated by some authors that, during the Atlantic climatic episode, the central and northern Plains were subjected to drought conditions that had a direct impact upon the indigenous human and animal populations. The grasslands probably became dominated by short grasses. Wedel (1964) postulates a virtual abandonment of the short grass Plains by human populations, while Reeves (1973) and Frison (1975) suggest the Plains did support viable human populations. Reeves believes that a focal bison hunting economy prevailed, while Frison postulates a reduction in the human population and adaptation to a more diffuse economy.

Sub-Boreal Climatic Pattern (3,100 to 800 B.C.)

During the Sub-Boreal climatic episode, there was probably a stronger flow of Arctic air into central Canada that displaced the climate and biota southward (Bryson and Wendland 1967:291-292). During the period from approximately 2,000 B.C. to the present, the Lake Agassiz lowland was

dominated by herbaceous pollen. *Quercus* (oak), *Betula* (birch), *Populus* (poplar and aspen) and *Pinus* (pine) expanded to their present frequencies along the edges of lakes and rivers. Grassland environments dominated the lake lowlands (Shay 1967:247-248; 251) such as the Lake Traverse project area.

This environment would have been more favorable for habitation by indigenous hunters and gatherers. Excavations of buried Archaic components at sites 21NR9 (Canning site) and 21NR29 indicate bison was frequently hunted by peoples using the Red River Valley at this time (Michlovic 1983b:4). These two sites, located on levees adjacent to the Red River, are about 161 kilometers (100 miles) north of Lake Traverse. The Corps lands around Lake Traverse at this time were either inundated, marshlands and/or grasslands. These low lying, unstable lands would not have been conducive to human habitation.

Sub-Atlantic Climatic Pattern (800 B.C. to A.D. 270)

The winters during the Sub-Atlantic climatic episode would have been stormier and wetter, in addition to wetter and cooler summers. This would have been a partial return to Late Glacial conditions (Bryson and Wendland 1967:292). The floristic communities in the project area would have been similar to those of the region immediately prior to Euro-American settlement. Beginning at approximately 2,000 B.C. and continuing to the present, several rivers in the Lake Agassiz basin underwent changes in their regimes. Filling episodes began sometime before 750 B.C. in the Red River Valley (Shay 1967:247-248; 251). In the Lake Traverse area, the low lying Corps lands were probably still either inundated, marshland, or grasslands susceptible to extreme wetness. These lands would not have been conducive to human habitation.

Neo-Atlantic Climatic Pattern (A.D. 270 to 1190)

Conditions similar to the Atlantic climatic episode started about A.D. 350 to 400. Summer rains extended farther into the southwest and corn-farming became practical across most of the Great Plains. This indicates westerlies were weaker, with an expansion of the boreal forest both north and south. A comparison of summer rainfall with strong westerlies indicates the present-day forest-prairie ecotone between northwestern Minnesota and southern Wisconsin was drier during the Neo-Atlantic climatic episode (Bryson and Wendland 1967:294).

Lehmer (1970:118) postulates a correlation between the climatic change during the Neo-Atlantic which provided a favorable climate for maize agriculture in the Middle Missouri region and the first appearance of horticultural villages in South Dakota at about A.D. 900. There are two recorded fortified village sites in Roberts County (39RO5, Hartford Beach Village, and 39RO42) which, based upon

ceramics, appear to be affiliated with Great Oasis and the Initial Middle Missouri variant of the Middle Missouri Tradition. Excavations at 39R05 (Hartford Beach Village) indicate ceramic similarities with Great Oasis, which has its center southeast of Lake Traverse (Anfinson 1979:89). Great Oasis and Initial Middle Missouri peoples are known to have grown maize and other cultigens. These village sites are usually situated to take advantage of natural terrain for fortification and protection. Low lying Corps lands would not have been conducive for occupation by these village peoples.

Pacific Climatic Pattern (A.D. 1190 to 1550)

The westerlies increased at about A.D. 1200. The prairie peninsula extended eastward across Illinois and Indiana. There was reduced Tropical air flow into the northern Plains, reducing summer rainfall. Antelope increased in importance, in relation to bison, in the diet of hunters of western South and North Dakota. Bison became more important in the diet of the Mill Creek people of northwestern Iowa. It is postulated that some of the drought stricken Upper Republican and Nebraska farming people in Nebraska moved northward into South Dakota along the Missouri River. Farming in marginal areas of the western portions of the Plains became impossible (Bryson and Wendland 1967:296).

Lehmer (1970:121) postulates a correlation between the more severe (drier) climate of the Pacific I climatic episode (A.D. 1250 to 1450), which was unfavorable for maize agriculture, and the retraction of village territories and abandonment of many villages of the Middle Missouri variant. He also postulates a correlation between the more favorable climate of the Pacific II climatic episode (A.D. 1450 to 1550) and the extensive occupation of the Missouri River Valley in South Dakota by village societies. There is little data for the presence of village societies in the vicinity of Lake Traverse during this period. The recovery of shell tempered Sandy Lake pottery ware from site 39R045/21TR35 suggests nomadic peoples influenced by more easterly Mississippian societies were utilizing the resources in the Lake Traverse area during this period.

Neo-Boreal Climatic Pattern (A.D. 1550 to 1850)

The Neo-Boreal is oftentimes referred to as "The Little Ice Age". Summers were cool and autumns cold in the eastern United States. Glaciers formed as far south as New Mexico in the Rocky Mountains. There was a general deterioration of climate in the eastern United States during the Neo-Boreal climatic episode (Bryson and Wendland 1967:296). After about 1830 a warming trend began which lasted until about 1850. The climatic data provides substantial evidence for severe and mild winters in the United States between 1604 and 1870. The most severe winters were in the decades 1790 to 1799, 1800 to 1809 and 1830 to 1839. Some ethnographic evidence indicates severe hardships were encountered by indigenous populations in the Northern Plains at this time. Cultivated crops and

wild plants did not produce large quantities of food for winter stores and the severe winter temperatures greatly reduced animal populations that provided meat resources. Unstable climatic conditions during the end of the Neo-Boreal climatic episode reduced populations of fur bearing mammals that were trapped for the fur trade. Therefore, indigenous human populations that relied upon the fur trade for goods and services would have been adversely affected. The decline of the fur trade began during the mid 19th century. This decline may be partially attributed to unstable climatic conditions (Hastenrath 1972:20-39). The Lake Traverse area was the location of several fur trading posts during this time. But, by the mid 19th century, the fur bearing mammal populations had been decimated and the fur trade in the area declined in economic importance.

Recent Climatic Pattern (A.D. 1850 to the Present)

During the past 130 years, the climate in the Plains has been characterized by the return of strong westerlies. There has been less precipitation, with the 51 cm (20 inch) annual precipitation cline shifting from eastern Wyoming and Montana in 1915 to central North Dakota by 1936 (Wedel 1961:84). The historic occupation of site 39RO44 occurred during this period (ca. 1904 to 1940).

The preceding interpretations are an attempt to demonstrate a correlation between past climatic patterns, biota, and human responses to changing environments. The literature on past climates and biotic response to climatic change is voluminous and is only highlighted above.

Fauna

Mammals

Lake Traverse is situated within the tall grass prairie. Data on the early historic fauna of the project area furnished by early traveler reports and fur traders indicate that the tall grass prairie sustained a wide variety of animals. Table 3 lists mammals that were indigenous to the project area prior to Euro-American settlement. Several mammal species, particularly buffalo (*Bison bison*) and pronghorn (*Antilocapra americana*), black bear (*Ursus americanus*), and caribou (*Rangifer tarandus*) were once fairly common in the region but have subsequently been reduced in numbers within their former range (Hall and Kelson 1959; Ernst and French 1976).

Amphibians and Reptiles

Several species of toads, frogs, turtles and snakes occur within the project area (Table 4) (Over 1923). There presently is no archaeological evidence that any of these species were utilized by prehistoric peoples. However, ethnographic accounts in neighboring areas report the use of amphibians and reptiles by Plains peoples.

Table 3

Mammals Indigenous to the Region
Prior to Euro-American Settlement

Name	Common Name
Sorex cinereus	Masked shrew
Sorex palustris	Water shrew
Sorex arcticus	Arctic shrew
Microsorex hoyi	Pygmy shrew
Blarina brevicauda	Short-tailed shrew
Myotis lucifugus	Little brown myotis
Myotis keenii	Keen's myotis
Lasionycteris noctivagans	Silver-haired bat
Eptesicus fuscus	Big brown bat
Lasiurus borealis	Red bat
Lasiurus cinereus	Hoary bat
Sylvilagus floridanus	Eastern cottontail
Lepus townsendii	White-tailed jackrabbit
Tamias striatus	Eastern chipmunk
Spermophilus richardsonii	Richardson's ground squirrel
Spermophilus tridecemlineatus	13-lined ground squirrel
Spermophilus franklinii	Franklin's ground squirrel
Sciurus niger	Fox squirrel
Tamiasciurus hudsonicus	Red squirrel
Geomys bursarius	Plains pocket gopher
Perognathus flavescens	Plains pocket mouse
Castor canadensis	Beaver
Reithrodontomys megalotis	Western harvest mouse
Peromyscus maniculatus	Deer mouse
Peromyscus leucopus	White-footed mouse
Onychomys leucogaster	Northern grasshopper mouse
Clethrionomys gapperi	Gapper's red-backed mouse
Microtus pennsylvanicus	Meadow vole
Microtus ochrogaster	Prairie vole
Ondatra zibethicus	Muskrat
Synaptomys cooperi	Southern bog lemming
Zapus hudsonius	Meadow jumping mouse
Zapus princeps	Western jumping mouse
Erethizon dorsatum	Porcupine
Canis latrans	Coyote
Canis lupus	Gray wolf
Vulpes fulva	Red fox
Vulpes velox	Swift fox
Urocyon cinereoargenteus	Gray fox
Ursus americanus	Black bear
Procyon lotor	Raccoon
Mustela erminea	Ermine
Mustela rixosa	Least weasel
Mustela frenata	Long-tailed weasel
Mustela vison	Mink
Taxidea taxus	Badger
Spilogale putorius	Eastern spotted skunk

Name	Common Name
Mephitis mephitis	Striped skunk
Lutra canadensis	River otter
Felis concolor	Mountain lion
Lynx canadensis	Lynx
Lynx rufus	Bobcat
Cervus canadensis	Wapiti
Odocoileus hemionus	Mule deer
Odocoileus virginianus	White-tailed deer
Antilocapra americana	Pronghorn
Bison bison	Bison
Rangifer tarandus	Caribou

Table 4

Amphibians and Reptiles in the Project Area

Name	Common Name
Amphibians:	
Ambystoma tigrinum	Tiger salamander
Necturus maculosus	Waterdog
Bufo americanus	American toad
Acris gryllus	Cricket frog
Bufo cognatus	Great Plains toad
Bufo hemionphrys	Dakota toad
Bufo woodhousei	Rocky Mountain toad
Pseudacris nigrita	Chorus frog
Rana pipiens	Leopard frog
Reptiles:	
Chelydra serpentina	Snapping turtle
Chrysemys picta	Painted turtle
Eumeces septentrionalis	Prairie skink
Storeria dekayi	Brown snake
Storeria occipitomaculata	Red-bellied snake
Thamnophis radix	Plains garter snake
Thamnophis sirtalis	Red-sided garter snake
Coluber constrictor flaviventris	Eastern yellow-bellied racer
Heterodon nasicus	Western hog-nosed snake
Opheodrys vernalis	Smooth green snake
Pituophis melanoleucus	Bull snake

Fish

Fish could have provided a reliable food source for prehistoric and historic inhabitants of the region. Table 5 lists the fish families present in the region (Berra 1981). Fish vertebrae have been recovered from site 21NR11 (Michlovic 1980:161; 1982b:58), which is located along the Red River approximately 161 kilometers (100 miles) north of Lake Traverse.

Birds

A large variety of avifauna inhabit the project area. A large number of these are migratory waterfowl which are seasonal inhabitants. The project area is within the Mississippi River Corridor (Bellrose 1968) which starts on the Manitoba border in central North Dakota and stretches southeastward to southeast Iowa and northeast Missouri, bordering on the Mississippi River. From there it extends eastward to the Illinois River Valley where it turns south, terminating on the gulf coast of Louisiana. The Mississippi River Corridor is used by approximately 2,500,000 dabbling ducks, of which 2,000,000 are mallards, 200,000 are pintails, 125,000 are baldpates, 70,000 are green-winged teals, 50,000 are gadwalls and 20,000 are shovelers (Bellrose 1968).

Lake Traverse is within the Central Flyway (Missouri River Corridor) used by diving ducks. This flyway is different from the Central Flyway used by dabbling ducks. The Central Flyway for diving ducks enters North Dakota farther east than its dabbling duck counterpart. The flyway extends south to Kansas City, Missouri, where it then divides three ways. Above Kansas City, this corridor is used by about 175,000 lesser scaups, 50,000 ring-necked ducks, 2,000 redheads, and lesser numbers of canvasbacks. Large numbers of Canada geese use the Red River of the North as a corridor to the Big Sioux River or to the Minnesota River at Big Stone Lake and then proceed to areas further south (Bellrose 1968). Table 6 lists birds indigenous to the project area prior to Euro-American settlement. Some are only seasonal inhabitants (Bull and Farrand 1977). They may have been utilized by the prehistoric inhabitants of the Lake Traverse area.

Flora

Few early explorer and settler accounts mention the flora of the region in detail. Table 7 (Stephens 1973) lists the woody plants found within the project region. Many of the plants and trees provide substantial quantities of foodstuffs that could have been used by the indigenous human populations.

The project area is within the mixed grass prairie biota community that is the ecotone (Odum 1971:157) between the more easterly tall grass prairie and northern deciduous forest and the more westerly short grass plains. The Minnesota and Red River of the North drainages have a

Table 5

Fish Families in the Project Area

Family	Common Name
Petromyzonidae	Lampreys
Acipenseridae	Sturgeons
Lepisosteidae	Gars
Amiidae	Bowfins
Hiodontidae	Mooneyes
Salmonidae	Trouts, salmons
Esocidae	Pikes
Cyprinidae	Minnows, carp
Catostomidae	Suckers
Ictaluridae	North American catfishes
Percopsidae	Troutperch
Gadidae	Cods
Cyprinodontidae	Killifishes, topminnows
Gasterosteidae	Sticklebacks
Cottidae	Sculpins
Percichthyidae	Percichthyids
Centrarchidae	Sunfishes, basses
Percidae	Perch, darters
Sciaenidae	Drums, croakers

deciduous hardwood forest community. Prior to cultivation, the Red River of the North and the Minnesota River lowland were covered almost entirely by grassland vegetation. This is confirmed by examination of the General Land Office (GLO) maps and notes. The grasslands are dominated by herbaceous plants. Herbaceous plants are composed of two main groups, grasses and forbs, with grasses being dominant.

The grasses are of two or more heights, with tall grasses attaining heights of 50 to 150 cm (20 to 59 inches), and short grasses attaining heights of 5 to 40 cm (2 to 16 inches). The mixed grass prairie contains a mixture of both major grasses. The dominant plants are porcupine grass, prairie dropseed, little bluestem, side-oats grama, June-grass, western wheatgrass, plains muhly, panic grass, sedge, green needlegrass, needle-and-thread grass, sand dropseed, slender wheatgrass, galleta, and purple three-awn. Forbs include broomweed, scurf-pea, sunflowers, goldenrods, and ragweed.

A prolonged drought causes the mixed grasses to be overcome or dominated by short grasses. Excessive precipitation causes the mixed grasses or short grasses to become dominated by the tall grasses. These flora changes, due to changing climatic patterns, are also reflected in the fauna associations (Shelford 1978:334-340). A large number of plant species producing a diverse range of food types are available for exploitation in varying densities at different seasons throughout the region. Shay (1967) and Watts and Bright (1968) provide summaries of the vegetational history of the project region.

The Environment During Field Work

The field work portion of this project was conducted during the last week of October and the first week of November, 1982. Sites were recorded in cultivated fields, grasslands and wooded areas. Grass cover reduced the visibility of small prehistoric campsites. These small sites, of low visibility, are most discernible in barren ground, such as cultivated fields, cattle paths, and rodent backdirt piles.

Summary

The project area provided the indigenous inhabitants with a variety of plant and animal foods. Many of the food resources were available seasonally, and should be reflected in the utilization of the region by prehistoric peoples. The region, located in the mixed grass prairie, has undergone several major post-glacial climatic episodes that altered the local flora and fauna resources. These past climatic events undoubtedly influenced the peoples utilizing these resources.

Table 6

Birds Indigenous to the Project Area Prior to Euro-American Settlement

Name	Common Name
Podiceps nigricollis	Eared Grebe
Charadrius melodus	Piping Plover
Sterna forsteri	Forster's Tern
Catoptrophorus semipalmatus	Willet
Limosa fedoa	Marbled Godwit
Numenius americanus	Long-billed Curlew
Ixobrychus exilis	Least Bittern
Nycticorax nycticorax	Black-crowned Night Heron
Botaurus lentiginosus	American Bittern
Larus pipixcan	Franklin's Gull
Chlidonias nigra	Black Tern
Anas crecca	Green-winged Teal
Anas americana	American Wigeon
Anas clypeata	Northern Shoveler
Oxyura jamaicensis	Ruddy Duck
Anas acuta	Pintail
Fulica americana	American Coot
Anas discors	Blue-winged Teal
Pelecanus erythrorhynchos	White Pelican
Podilymbus podiceps	Pied-billed Grebe
Phalaropus tricolor	Wilson's Phalarope
Recurvirostra americana	American Avocet
Porzana carolina	Sora
Rallus limicola	Virginia Rail
Capella gallinago	Common Snipe
Asio flammeus	Short-eared Owl
Circus cyaneus	Marsh Hawk
Cistothorus platensis	Short-billed Marsh Wren
Cistothorus palustris	Long-billed Marsh Wren
Xanthocephalus xanthocephalus	Yellow-headed Blackbird
Melospiza georgiana	Swamp Sparrow
Agelaius phoeniceus	Red-winged Blackbird
Ardea herodias	Great Blue Heron
Phalacrocorax auritus	Double-crested Cormorant
Anas platyrhynchos	Mallard
Aythya americana	Redhead
Aythya valisineria	Canvasback
Aythya collaris	Ring-necked Duck
Aythya affinis	Lesser Scaup
Lophodytes cucullatus	Hooded Merganser
Branta canadensis	Canada Goose
Actitis macularia	Spotted Sandpiper
Iridoprocne bicolor	Tree Swallow
Stelgidopteryx ruficollis	Rough-winged Swallow
Riparia riparia	Bank Swallow
Megaceryle alcyon	Belted Kingfisher
Bartramia longicauda	Upland Sandpiper

Name	Common_Name
Charadrius vociferus	Killdeer
Tympanuchus cupido	Greater Prairie Chicken
Perdix perdix	Gray Partridge
Phasianus colchicus	Ring-necked Pheasant
Chordeiles minor	Common Nighthawk
Athene cunicularia	Burrowing Owl
Buteo lagopus	Rough-legged Hawk (winter)
Buteo swainsoni	Swainson's Hawk
Falco sparverius	Sparrow Hawk
Hirundo rustica	Barn Swallow
Petrochelidon pyrrhonota	Cliff Swallow
Melanerpes erythrocephalus	Red-headed Woodpecker
Carduelis tristis	American Goldfinch
Sturnella neglecta	Western Meadowlark
Lanius excubitor	Northern Shrike (winter only)
Lanius ludovicianus	Loggerhead Shrike
Tyrannus tyrannus	Eastern Kingbird
Sialia sialis	Eastern Bluebird
Tyrannus verticalis	Western Kingbird
Euphagus cyanocephalus	Brewer's Blackbird
Chondestes grammacus	Lark Sparrow
Spizella pusilla	Field Sparrow
Spizella pallida	Clay-colored Sparrow
Ammodramus savannarum	Grasshopper Sparrow
Spiza americana	Dickcissel
Plectrophenax nivalis	Snow Bunting
Passerculus sandwichensis	Savannah Sparrow
Calamospiza melanocorys	Lark Bunting
Pooecetes gramineus	Vesper Sparrow
Calcarius ornatus	Chestnut-collared Longspur
Dolichonyx oryzivorus	Bobolink
Eremophila alpestris	Horned Lark
Zenaida macroura	Mourning Dove
Columba livia	Rock Dove
Progne subis	Purple Martin
Chaetura pelagica	Chimney Swift
Colaptes auratus	Common Flicker
Icterus galbula	Northern Oriole
Turdus migratorius	American Robin
Dumetella carolinensis	Gray Catbird
Junco hyemalis	Dark-eyed Junco
Cyanocitta cristata	Blue Jay
Sayornis phoebe	Eastern Phoebe
Archilochus colubris	Ruby-throated Hummingbird
Troglodytes aedon	House Wren
Toxostoma rufum	Brown Thrasher
Bombycilla cedrorum	Cedar Waxwing
Molothrus ater	Brown-headed Cowbird
Passer domesticus	House Sparrow
Spizella passerina	Chipping Sparrow
Melospiza melodia	Song Sparrow
Sturnus vulgaris	Starling
Quiscalus quiscula	Common Grackle

Name	Common Name
Corvus brachyrhynchos	Common Crow
Dendroica petechia	Yellow Warbler
Geothlypis trichas	Common Yellowthroat
Setophaga ruticilla	American Redstart
Pipilo erythrophthalmus	Rufous-sided Towhee
Carduelis flammea	Common Redpoll (winter only)
Passerina amoena	Lazuli Bunting
Passerina cyanea	Indigo Bunting
Empidonax traillii	Willow Flycatcher
Coccyzus erythropthalmus	Black-billed Cuckoo
Otus asio	Screech Owl
Aegolius acadicus	Saw-whet Owl
Accipiter cooperii	Cooper's Hawk
Buteo platypterus	Broad-winged Hawk
Buteo jamaicensis	Red-tailed Hawk
Cathartes aura	Turkey Vulture
Picoides pubescens	Downy Woodpecker
Piroides villosus	Hairy Woodpecker
Sphyrapicus varius	Yellow-bellied Sapsucker
Sitta carolinensis	White-breasted Nuthatch
Certhia familiaris	Brown Creeper
Parus articapillus	Black-capped Chickadee
Vireo olivaceus	Red-eyed Vireo
Vireo gilvus	Warbling Vireo
Empidonax minimus	Least Flycatcher
Contopus virens	Eastern Wood Pewee
Myiarchus crinitus	Great Crested Flycatcher
Catharus fuscescens	Veery
Seiurus aurocapillus	Ovenbird
Mniotilta varia	Black-and-white Warbler
Asio otus	Long-eared Owl
Bubo virginianus	Great Horned Owl
Accipiter striatus	Sharp-shinned Hawk
Accipiter gentilis	Goshawk
Sitta canadensis	Red-breasted Nuthatch
Hesperiphona vespertina	Evening Grosbeak
Carpodacus purpureus	Purple Finch
Loxia curvirostra	Red Crossbill
Loxia leucoptera	White-winged Crossbill
Pinicola enucleator	Pine Grosbeak
Regulus satrapa	Golden-crowned Kinglet
Bombycilla garrulus	Bohemian Waxwing
Carduelis pinus	Pine Siskin
Pica pica	Black-billed Magpie
Podiceps auritus	Horned Grebe
Anas strepera	Gadwall
Ammodramus bairdii	Baird's Sparrow
Grus canadensis	Sandhill Crane
Coccyzus americanus	Yellow-billed Cuckoo
Vireo flavifrons	Yellow-throated Vireo
Icterus spurius	Orchard Oriole

Table 7

Woody Plants in the Project Area
(from Stephens 1973 and U.S. Department of Agriculture 1979)

Name	Common Name
Salix amygdaloides	Peach-leaved willow
Salix exigua	Sandbar willow
Populus alba	Silver poplar
Populus deltoides	Cottonwood
Quercus macrocarpa	Bur oak
Ulmus americana	American elm
Celtis occidentalis	Hackberry
Ribes americanum	Black currant
Ribes missouriense	Wild gooseberry
Rosa suffulta	Prairie rose
Prunus americana	Wild plum
Prunus virginiana	Choke cherry
Amorpha fruticosa	False indigo
Rhus glabra	Smooth sumac
Toxicodendron radicans	Poison ivy
Acer negundo	Box elder
Parthenocissus vitacea	Woodbine
Vitis riparia	Riverbank grape
Tilia americana	Basswood, linden
Oenothera serrulata	Evening primrose
Fraxinus pennsylvanica	Green ash
Lonicera tatarica	Tartarian honeysuckle
Symphoricarpos occidentalis	Wolfberry
Viburnum lentago	Sheepberry, wild raisin
Ulmus rubra	Red elm
Crataegus chrysocarpa	Hawthorn
Psedera quinquefolia	Virginia creeper
Ostrya virginiana	Ironwood
Symphoricarpos albus	Snow berry

CHAPTER 3

Prehistoric and Historic Overviews

Introduction

The Lake Traverse and Red River watersheds are located within the Plains Indian cultural region defined by Wedel (1961) as the Northeastern Periphery, but this designation is misleading, suggesting that this subarea of the Great Plains was peripheral to important developments occurring on the rest of the Great Plains. Recently, investigations within this subarea have indicated that, in addition to having cultural affiliations with surrounding regions, it was a locus of its own cultural developments as well. As a result, it has been suggested that this subarea should now be referred to as the Northeastern Plains (Anfinson 1982b:67; Fox 1982) and this designation has been adopted in the present study. Prehistoric and historic cultural data from this region will be presented to provide an overview of the archaeological manifestations of northeastern South Dakota and southwestern Minnesota (Table 8).

Culturally, the early inhabitants of the Northeastern Plains (i.e. Paleo-Indian and Archaic peoples) were probably band-level hunters and gatherers who shifted residence in response to available food resources and whose sites are characterized by tools indicating specialized activities of short duration and low visibility. Woodland and later prehistoric groups probably tended to be somewhat more sedentary. Areas of greater topographic relief would have been the most favorable for human occupation. Tool assemblages often lack temporally diagnostic tools. Projectile points and pottery (pottery occurs very late, temporally) provide the most information for assigning temporal placement of site occupation.

Paleo-Indian Period (10,000 B.C. to 6,000 B.C.)

The Paleo-Indian period, which is poorly represented in the Northeastern Plains, consists of three complexes. The earliest is the Llano complex (10,000 B.C. to at least 9,000 B.C.) which is characterized by the fluted Clovis projectile point which has been found in association with now-extinct Pleistocene megafauna, such as mammoth. No Clovis sites have been recorded in the project area, although surface finds of Clovis points have occurred in eastern South Dakota (Lass 1977:2) and in southern and central Minnesota (Johnson 1978:5).

The methods employed by the nomadic mammoth hunters in killing mammoth can only be conjectured. Once a young, old, or sick animal was separated from the herd, it could have been dispatched by a group of experienced hunters armed with Clovis-tipped spears. Animals may also have been trapped at water holes, in marshes, in broken terrain, or at slippery stream crossings and successfully attacked. There is no

Table 8

Cultural Historical Sequence for the Project Area

B.C./A.D.		
1800	Euro-American settlement	
1700	Dakota	
	Oneota Tradition (A.D. 1200-1700)	Mississippian
	Cambria phase (A.D. 1000-1300)	
	Initial Middle Missouri variant (A.D. 900-1400)	
	Great Oasis (A.D. 900-1250)	Plains Village
1000		
	Lake Benton phase (A.D. 800-1300[?])	
	St. Croix phase (A.D. 300-800)	Plains Woodland
A.D. 1	Fox Lake phase (200 B.C.-A.D. 900)	
500		
		Plains Archaic
5000		
	Plano	
		Paleo-Indian
	Folsom	
10,000	Llano	

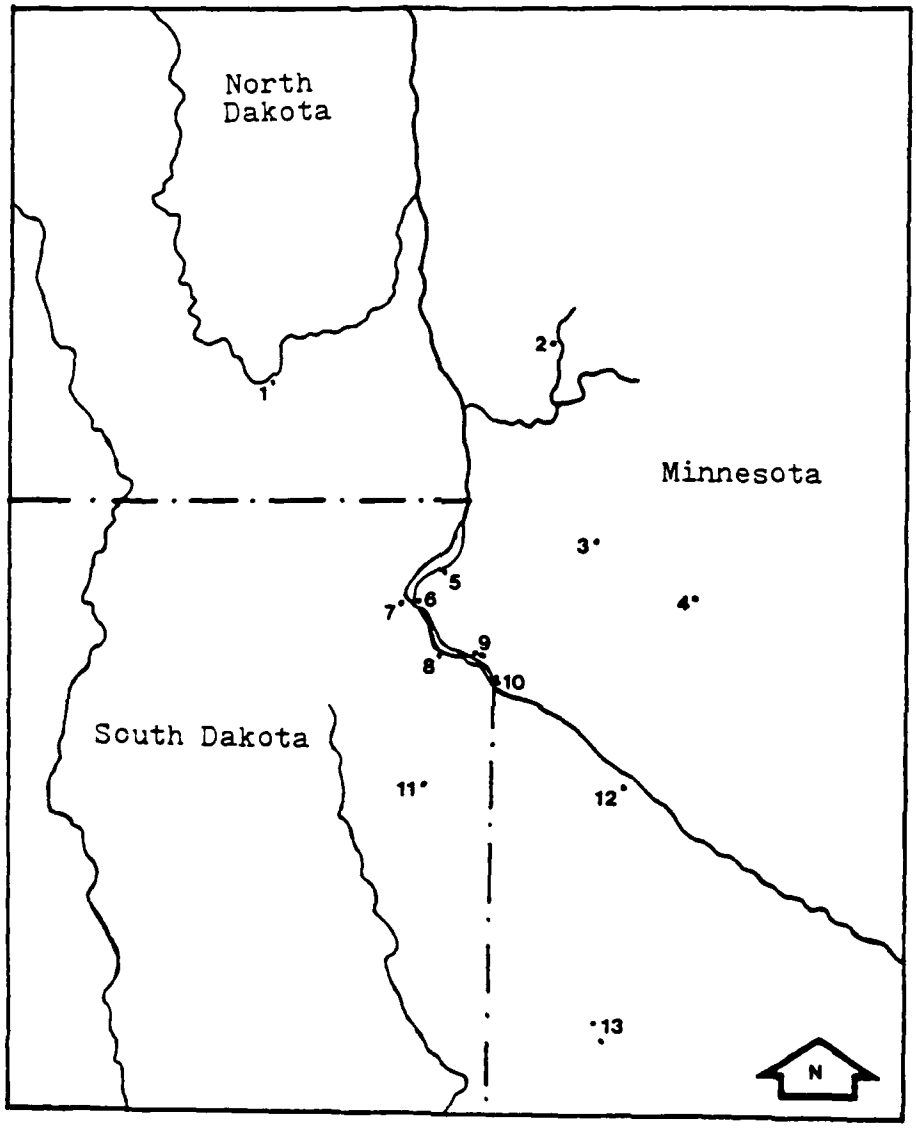
indication of the use of poison, pits, fire, or communal drives in the procurement of mammoth (Wedel 1961:59). The meat diet of the mammoth hunters was probably supplemented with nuts, berries and tubers. Due to climatic change and/or overkill, mammoth became extinct and were replaced by bison as the main meat source for prehistoric Plains peoples.

The second Paleo-Indian complex is the Folsom complex (9,000 B.C. to 8,000 B.C.). Definitions of this complex are based on the temporally diagnostic Folsom and, possibly, Midland projectile point styles and their association with now-extinct forms of bison. Surface finds of Folsom points have occurred in eastern South Dakota (Lass 1977:2) and in southern and central Minnesota (Johnson 1978:5), but no Folsom sites have been recorded in the project area.

The third Paleo-Indian complex is the Plano complex (8,000 B.C. to 6,000 B.C.). This complex is defined by the presence of temporally diagnostic Eden, Plainview, Alberta, Hell Gap, Agate Basin, Scottsbluff, Browns Valley, and Angostura projectile point styles and their association with modern bison (*Bison bison*). Surface finds of Plano projectile points are fairly common in the area (Lass 1980b:22). An Alberta point was recovered from the Ries site (39DE7)(Fig. 11) in northwestern Deuel County, South Dakota (Haug and Sterner 1978).

The Browns Valley Man site (21TR5)(Jenks 1934, 1935, 1937)(Fig. 11), located at Browns Valley, Minnesota, has been assigned to the Plano complex. It has been dated to about 6,000 B.C. The site yielded Browns Valley points, found in association with a male skeleton buried in a pit dug into a gravel bar that formed during the Tintah beach stage of Lake Agassiz. The pit fill contained little humus and the earth covering the pit appeared to be undisturbed, suggesting the burial occurred after the outlet channel that drained Lake Agassiz to the south during the Tintah stage ceased to be active but before much soil accumulated on the gravel bar (Johnson 1962b:160).

A second very old human skeleton (21OT3)(Fig. 11) has been recovered northeast of Browns Valley near Pelican Rapids in Otter Tail County, Minnesota. The remains are those of a teenaged girl named "Minnesota Man" (Jenks 1932, 1933, 1935, 1937). The skeleton was found almost three meters (10 feet) below ground surface, within the horizontal laminated layers of silt deposited in now-extinct Glacial Lake Pelican. An elk antler tool and a marine shell pendant were also recovered with the skeleton. Controversy surrounds the age of Minnesota Man. Geology and the extreme depth at which the remains were recovered suggest an early age. Attempts at radiocarbon dating the remains have been inconclusive (Wilford 1955:130). An Archaic period date was obtained from a carbon sample that was smaller than the minimum amount required for accuracy and which was originally contaminated by shellac



1. Biesterfeldt (32RM1)
2. Minnesota Man site (21OT3)
3. Peterson Lake (21GR4)
4. Pelican Lake (21PO2)
5. Wilson Mounds (21TR2)
6. Browns Valley
   Man site (21TR5)
7. De Spiegler (39RO23)
8. Hartford Beach
   Village (39RO5)
9. Lindholm (21BS3)
   Lou Miller (21BS4)
10. Schoen #2 (21BS1)
    Schoen #1 (21BS2)
11. Ries (39DE7)
12. 21YM35
13. Big Slough (21MU1)
    Great Oasis (21MU2)

Figure 11. Regional map showing the locations of sites discussed in the text.

(Johnson 1962b:160). Based on geology and the extreme depth of the remains, a Paleo-Indian age is accepted for Minnesota Man in the present study.

Bison was the main source of meat for Folsom and Plano peoples, although other species, such as deer, elk, and prong-horn antelope may also have been important. In a recent examination of Paleo-Indian bison procurement practices Nicholson (1982) concludes that the strategies employed consisted of the stalking, ambushing, or small-scale surrounding of bison by small hunting groups. Communal mass-killing of bison accomplished by stampeding a bison herd over a cliff or into a natural entrapment, such as a deep-sided ravine, where the bison were then killed, probably did not develop until the Archaic period. Fire may have been employed in the drives, although its importance is the subject of much controversy. The meat diet of the Paleo-Indian bison hunters was supplemented with wild plant foods, such as nuts, berries and tubers.

Plains Archaic Period (6,000 B.C. to 500 B.C.)

During the end of the late Paleo-Indian period a great variety of projectile point styles appear. The Archaic period is broadly characterized by stemmed and side-notched points and by the appearance of ground and pecked stone tools. Archaic peoples continued to follow a nomadic way of life, traveling seasonally to utilize different food resources in various localities (Johnson 1978:9).The subsistence pattern became more diffuse, reflecting a greater exploitation of local environments.

It is generally accepted that the major emphasis was still on the procurement of bison, although smaller game animals, fish, and wild plant foods increased in dietary importance from the Paleo-Indian period, but this view has recently been challenged. Analysis of cultural material from site 21YM35 (Fig. 11), located south of Granite Falls, Minnesota, suggests that no broad or sweeping generalizations concerning subsistence patterns are appropriate for the Prairie-Lakes region, which includes the present project area, during the Plains Archaic (Dobbs 1979:65). Dobbs (1979: 67) cautions against interpreting prehistoric diet simply in terms of meat consumption. The nutritional needs and economic decisions of the population need to be considered. Since sites within the Prairie-Lakes region are generally located in close proximity to a variety of environmental zones (e.g., upland prairie, slope forest, floodplain forest, marsh, slough, streams, small upland lakes, lake margins), a focal bison hunting economy is not evidenced. Rather, a diffuse economic system involving use of a broad variety of resources probably occurred within the Prairie-Lakes region during the Plains Archaic (Dobbs 1979:71-74).

Scattered surface finds of Archaic period projectile points have been reported from sites, such as the

aforementioned Ries site (39DE7)(Haug and Sterner 1978), throughout southwestern Minnesota and northeastern South Dakota. The Pelican Lake site (21PO2)(Fig. 11) is an Archaic burial site situated on a glacially formed gravel knoll adjacent to the northeast corner of Pelican Lake. The remains of six skeletons and a few associated artifacts were recovered from four shallow burial pits dug into the gravel subsoil. Each pit was lined with red ochre. The artifacts are suggestive of an Eastern Archaic site association (Johnson 1962a). The Peterson Lake site (21GR4)(Fig. 11), situated near the west edge of Peterson Lake, contained a single primary burial in a pit dug into gravel and covered with boulders. Based on the burial mode and associated artifacts, this site has been assigned to the Archaic with a possible Red Ochre cultural affiliation (Goetzinger and Johnson 1967).

Stone circles are common archaeological phenomena on the northern Great Plains. "Their range extends from just west of the Rocky Mountains to western Minnesota and northwest Iowa, south into Nebraska and north into Saskatchewan and Alberta" (Hovde 1982:33). A number of these stone circles have been assigned to the Archaic period on the basis of projectile point styles and radiocarbon dates (Quigg 1979, 1981:54-60; Mulloy 1954:63; Brasser 1982:314-318; Frison 1978:51; Larson 1981). These stone circles have been interpreted as having been constructed in conjunction with circular lodges or tipis (Frison 1978:51; Kehoe 1958; Mulloy 1960:1-3), although some may be the remains of corral structures and other forms of animal traps (Malouf 1960:3-5; Moomaw 1960:5-9). Several stone circle sites recorded in the region (Lass 1980a) may have Archaic affiliations.

Woodland Period (500 B.C. to A.D. 1000)

The Woodland period in southwestern Minnesota is characterized by the appearance of pottery, burial mounds, and possibly limited horticulture. It is during this time that the atlatl was being replaced by the bow-and-arrow (Reeves 1970). The basic subsistence-settlement pattern of the Woodland groups of southwestern Minnesota probably developed in the Late Archaic and persisted apparently unchanged throughout the Woodland period (Anfinson 1982a:54, 67-68, 1982b:75). Warm season habitation sites of this period are located on islands or peninsulas in shallow lakes, while winter sites are probably located in wooded river valleys (Anfinson 1982a:53, 67; Shane 1982:48). Bison was probably the primary food resource, although recent analyses (Anfinson 1982a; Shane 1982) indicate fish, small mammals and plants may have been more important subsistence resources than previously believed.

The earliest Woodland complex within the project region is the Fox Lake phase (200 B.C. to A.D. 900). Projectile point styles are generally stemmed and side-notched varieties. Fox Lake ceramics consist of incised, trailed, and vertical or horizontal cordmarked, bossed or punctated

conoidal-shaped pottery vessels having thick walls (Wilford 1955:133; Hudak 1978; Anfinson 1979:73-79). The ceramics may have been influenced by developments in Illinois (Hudak 1974:24, 1978). The burial pattern is not known.

The Fox Lake phase is partially contemporaneous with the Lake Benton phase (A.D. 800 to A.D. 1300[?])(Anfinson 1982b:75). Although ceramic changes are, at present, the only recognized distinguishing criteria between the Fox Lake and Lake Benton phases, the introduction of burial mounds may also be a possible distinguishing characteristic (Anfinson 1982b:75). Lake Benton phase ceramics are characterized by thinner-walled vessels exhibiting cordwrapped stick impressed exterior decoration. Trailed decorations disappear and the use of bosses and punctates decreases. Vessel shape is more globular with rounded shoulders and conoidal bases (Anfinson 1979:109-110, 1982b:75). Burial mounds may have initially occurred during this phase or shortly before. As a result, many of the mound groups in southwestern Minnesota may be associated with the Lake Benton phase. Projectile points are generally side-notched and corner-notched triangular varieties. No data concerning habitation structures are available. It is not known when the Lake Benton phase ended. At the Big Slough site (21MU1)(Fig. 11), Lake Benton, Great Oasis and Oneota ceramics are intermixed in the upper levels of the site (Anfinson 1982a, 1982b:75). This suggests several possibilities: (1) Lake Benton phase peoples may have coexisted with the horticultural groups or (2) they may have been transformed into the horticultural groups (e.g., Great Oasis, Oneota) that are recognized in the region.

The St. Croix phase (A.D. 300 to A.D. 800) is transitional between Middle and Late Woodland. This phase, located north of Fox Lake and Lake Benton phase sites, "stretches from the northwestern corner of Wisconsin across eastern and central Minnesota into the Red River Valley" (Gibbon and Caine 1980:61). Lake Traverse is situated within its geographical boundaries. St. Croix ceramics consist of moderately flared vessels with cordmarked bodies and subconoidal bases. Decoration, confined to the rim, consists of dentate stamped, comb stamped, or cordwrapped stick impressed bands. Projectile points associated with this phase are finely-made isosceles triangular points or small side-notched points. Most St. Croix sites are situated on small streams near lake outlets. "Many of these locations are adjacent to lakes which are known today for their excellent wild-rice harvests, fishing, and waterfowl hunting" (Gibbon and Caine 1980:61). This suggests that St. Croix peoples employed a broad-based subsistence strategy that consisted of hunting, fishing, and gathering including possible wild rice harvesting. The De Spiegler site (39RO23)(Fig. 11), located in Roberts County, South Dakota, has a St. Croix component dated at A.D. 600 (Anfinson 1979:169; Caine 1974:60-61; Gibbon and Caine 1980:62).

The Onamia ceramic type is a late Middle Woodland or early Late Woodland manifestation from central Minnesota that occasionally appears in southwestern Minnesota where it is associated with the Lake Benton phase (Anfinson 1979:149). In addition, it is closely related to St. Croix ceramics. Onamia ware consists of cordwrapped stick impressed and dentate stamped vessels with rounded shoulders and conoidal bases. Projectile points are primarily side-notched varieties, but some unnotched, triangular forms occur also.

During the Woodland period there was widespread construction of linear and circular mounds containing flexed and disarticulated primary and secondary bundle burials in pits. Utilitarian and ornamental grave goods made predominantly of bone and shell are associated with the burials. This mound complex, defined as the Arvilla complex (Wilford 1941:243-246, 1955:137-138; Johnson 1973), is dated from A.D. 600 to A.D. 900 (Johnson 1973:66). Geographically, this complex encompasses an area "extending west from the St. Croix River to the Red River and then north along the Red River" (Johnson 1973:66). This area includes portions of northeastern South Dakota, eastern North Dakota, and Manitoba. Several burial mound sites within the Lake Traverse area have been assigned to the Arvilla complex: De Spiegler (39RO23)(Wilford 1955:137) and Wilson (21TR2)(Johnson 1973:42-43)(Fig. 11).

Plains Village Period (A.D. 1000 to A.D. 1350)

One of the earliest Plains Village complexes is the Great Oasis phase (A.D. 900 to A.D. 1250). It was originally defined by Wilford (1945, 1955) on the basis of investigations conducted at the Great Oasis site (21MU2)(Fig. 11), Murray County, southwestern Minnesota, but it is more common in South Dakota, Iowa, and Nebraska than in Minnesota (Anfinson 1982b:76). It is centered in northwestern Iowa. Although Great Oasis developed out of a Woodland base (Anderson 1975:34; Anfinson 1979:88), it has been suggested that this complex is related to the Initial Middle Missouri (Johnson 1969; Henning and Henning 1978).

Great Oasis house structures are rectangular in outline. Projectile points are unnotched or side-notched triangular varieties. Great Oasis pottery in Minnesota is characterized by high rim, globular vessels with trailed or plain, smoothed rims (Wilford 1945:35-36). In Minnesota, subsistence-settlement patterns are similar to those of the preceding and contemporaneous Woodland phases (Anfinson 1979:87, 1982b:76). Although there is no direct evidence for Great Oasis agriculture in Minnesota, bison scapula hoes recovered from non-Minnesota sites are suggestive of a mixed agricultural/hunting-gathering subsistence economy.

The Cambria phase (A.D. 1000 to A.D. 1300) is contemporaneous with Great Oasis. Generally, Cambria sites are found on high terraces of the upper Minnesota River (Johnson

1961:54). They are characterized by bell-shaped storage pits, unnotched and side-notched triangular points, snub-nosed thumbnail scrapers, sandstone abraders, ceramic gaming pieces, scapula hoes, clay elbow pipes, and quantities of bone, shell and corn refuse (Wilford 1945:32-34; Anfinson 1979:51). Cambria pottery vessels are predominantly grit tempered jars with rounded bodies and well-defined shoulders that have been decorated with incised or trailed designs. Decoration is restricted to upper portions of the vessels (Wilford 1945:36-38; Knudson 1967; Shay 1966). Cambria burial mounds, which are characteristically flat-topped, have yielded multiple primary burials with associated grave goods. Woodland, Mississippian, and Initial Middle Missouri influences are suggested (Wilford 1945, 1955; Knudson 1967; Johnson 1961). Several Cambria sites are located near the project area in Big Stone County, Minnesota: Lindholm (21BS3), Lou Miller (21BS4), Schoen #2 (21BS1), and Schoen #1 (21BS2)(Fig. 11).

Subsistence was based on maize agriculture, hunting, and gathering. Watrall (1974) has suggested that Cambria peoples initially possessed an intermediate subsistence pattern having segments (e.g, maize horticulture and bison hunting) on which increased dependence could be placed, if necessary. Later, due to ecological and cultural factors, the Cambria intermediate type subsistence pattern shifted to a focal subsistence type dependent on bison hunting.

The Initial Middle Missouri variant (A.D. 900 to A.D. 1400) was one of the first village cultures to appear in South Dakota. Initial Middle Missouri village sites occur most frequently in the southeastern two-thirds of South Dakota along the Big Sioux River, James River, and Missouri River valleys. Villages consist of rectangular houses with lengths typically more than one and one-half times their widths. House sizes vary, with the most common being approximately 12 by 6 meters (35 by 25 feet). House floors are found one meter or greater below present ground surfaces and raised benches are sometimes found at one or both ends of the floor. Interior firepits are shallow basins located near the entrance. Cache pits occur frequently in the house floors. Entrances are located at the south end of the houses and consist of narrow, roofed chambers extending two to three meters or more beyond the end of the houses (Lehmer 1971).

Village sizes vary with 20 to 30 houses being most common. Most houses are arranged side by side in more or less regular rows. Some villages have a central open space, and fortifications may or may not be present. Fortified Initial Middle Missouri villages utilized natural topographic features, such as bluffs, for protection on two or three sides and a simple ditch across the other sides. Additional protection was provided by a palisade erected along the inner edge of the fortification ditches (Lehmer 1971).

Burial customs are not known for the Initial Middle Missouri variant. It is possible that inhumations were made some distance from the villages. The mass burial of about 500 individuals within the fortification ditch at the Crow Creek site (39BF11)(Zimmerman et al. 1981) appears to be a unique case. It is possible, however, that other Middle Missouri variant sites with fortification ditches may also contain mass burials as a result of attack.

The pottery from sites assigned to the Middle Missouri Tradition have coarse, granular, rather porous paste heavily tempered with crushed granite. Nearly all of the vessels are jars. Cord-roughened bodies occur in the Initial Middle Missouri sites. The majority of vessels of the Middle Missouri Tradition have either flared or S-rims. Handles are extremely rare. Projectile points are small, light, triangular in outline and are either unnotched or side-notched forms. A wide variety of chipped and ground stone tools occur. Bone tools and ornaments are common (Lehmer 1971).

Hartford Beach Village (39RO5)(Fig. 11) is a fortified village situated on the bluffs overlooking Big Stone Lake. Although no earthlodge depressions have been discerned and very little cultural material has been recovered from the site, it has been assigned to the Initial Middle Missouri (Sigstad and Sigstad 1973a:226-229; Haug 1981). This designation is confirmed by two radiocarbon dates, A.D. 1120 (WIS-1368) and A.D. 1300 (WIS-1370)(Haug 1983).

Mississippian Period (A.D. 1000 to A.D. 1700)

By about A.D. 1350, early Plains Village groups disappeared from Minnesota and eastern South Dakota. They may have been displaced by Oneota peoples of the Mississippian period. The Oneota Tradition is represented in the project area by the Blue Earth phase (A.D. 1000 to A.D. 1600). Most of the sites assigned to this phase are semi-sedentary villages situated on the floodplains of small tributary rivers (Anfinson 1979:39). Although no house structures have been defined, numerous cache pits have been discerned. Subsistence was based on maize agriculture and a broad-based hunting-gathering economy. The phase is characterized by shell tempered ceramic vessels and unnotched triangular points (Wilford 1941:235, 1945:33,35). Primary and secondary burials have been found in cemeteries near major Blue Earth villages (Anfinson 1979:39).

Proto-Historic Period (A.D. 1600 to A.D. 1750)

The Proto-historic period may be represented in the Lake Traverse area at site 39RO45/21TR35 which yielded Sandy Lake ceramics. These ceramics, dated from A.D. 1000 to A.D. 1750, extend from the Late Woodland into the early historic period and are associated with the Wanikan Culture (Birk 1977:31). They may represent proto-historic Dakota peoples (Ossenberg

1974:31-32; Michlovic 1982a,b, 1983a,b; Anfinson 1979:176, 1982b:81). Within its southern range, Sandy Lake ceramics are characterized by shell or grit tempered, globular, somewhat squat vessels exhibiting vertical cordmarked or smooth exteriors. Decoration, when present, consists of lip notching, interior lip notching, or interior punctates (Cooper and Johnson 1964). A number of sites containing Sandy Lake ceramics have recently been recorded along the Red River in Norman County, Minnesota (Michlovic 1982a,b,c, 1983a,b; Breakey 1981). The distribution of Sandy Lake ceramics extends from the Wisconsin tributaries of the St. Croix River across central Minnesota to the Red River Valley and into Manitoba and Ontario.

The ancestral Cheyenne probably dwelt in or near the project area during the Proto-historic period. According to oral tradition (Weist 1977:9-17; Grinnell 1972, vol. 1:4; Wood 1971:51), these people, an Algonquian-speaking group, originally lived along the shores of large lakes within the woodlands between the Great Lakes and Hudson Bay. They eventually migrated to present-day Minnesota where, by about 1650, they were already living in the upper Mississippi region. By 1675, they moved to the upper Minnesota River area, near the Yellow Medicine River where they built a fortified earth lodge village, practiced horticulture, and hunted buffalo. A 1688 map made by Jean-Baptiste Louis Franquelin, based on information supplied by the Dakota, indicates the Cheyenne were still living near the Yellow Medicine River but, shortly afterward, they built another fortified earth lodge village between Big Stone Lake and Lake Traverse.

Franquelin made another map about 1700 indicating that the Cheyenne had left the Minnesota River Valley and were living on the Sheyenne River in present-day North Dakota. They occupied this village until about 1770 or 1790. Although this village is commonly believed to be the Biesterfeldt site (32RM1)(Fig. 11), a fortified earth lodge village, its cultural identification has been questioned (Wood 1955, 1971). Based on artifact analyses, Wood (1971:59-60, 69-70) has suggested that the Biesterfeldt site is part of the Post-Contact Coalescent of the Plains Village pattern, closely related to villages on the Missouri River. During their stay on the Sheyenne River horticulture continued to be important, but the Cheyenne also became heavily dependent on bison. They eventually abandoned the Sheyenne River area, possibly forced out by the Chippewa and/or Dakota.

The Cheyenne moved to the Missouri River and eventually onto the High Plains. It has been pointed out that the movements of the Cheyenne to the Missouri and beyond probably did not occur as a tribal body. Rather, the movements were those of individual camps or villages (Wood 1971:70; Grinnell 1972:14-15, 21-22). "Settlements on the Minnesota River and on the Missouri may thus have been contemporaneous with the

village or villages on the Sheyenne River" (Wood 1971:70).

The following historical overview briefly summarizes historical events in the Lake Traverse area. The individual site reports relate the historical information known about each specific historic site, with reference to the site's relationship to the overview.

The Dakota

The Dakota or Sioux Tribe is divided into three cultural and dialectic subdivisions: (1) the Eastern or Santee division with the Dakota dialect, (2) the Middle or Wichiyela division with the Nakota dialect, and (3) the Western or Teton division with the Lakota dialect. Prior to white contact, the Dakota were Woodland Indians occupying the southern two-thirds of present-day Minnesota and adjacent areas of the surrounding states. At that time they were divided into seven bands or "council fires": (1) Mdewakanton, (2) Wahpekute, (3) Wahpeton, (4) Sisseton, (Eastern or Santee division), (5) Yankton, (6) Yanktonai, (Middle or Wichiyela division), and (7) Teton, (Western division).

The Dakota were first mentioned by French explorers and missionaries in about 1640. The first documented, direct white contact with the Dakota occurred in the spring of 1660 when two French explorers, Pierre Esprit Radisson and Medard Chouart, Sieur des Groseilliers, met a group of Santee Sioux and 17 additional Indian nations at a rendezvous in northwestern Wisconsin or eastern Minnesota. At this time, some Dakota groups had already left the woodlands and were living on the prairie (Radisson 1943:217-220). Father Louis Hennepin journeyed to the upper Mississippi area in 1680 where he was captured by Santee Sioux and taken to their village on Mille Lacs Lake. During his stay with the Santee he learned of the Tinthonha (Teton) Dakota, people of the prairie (Hennepin 1938:91-92).

These incidents suggest that prior to 1660 some of the Dakota, probably the Teton band, had made or were in the process of making the transition from a woodlands to a Plains group. On Franquelin's 1697 map, Dakota villages are located on eastern and western tributaries of the Mississippi River between the mouth of the Minnesota River and the Crow Wing River, on Mille Lacs Lake, and along the Minnesota River as far west as Big Stone Lake (Wedel 1974:163-164). In addition, as the result of contact with the Dakota in the 1680's and 1690's Le Sueur was aware of Dakota groups roaming the plains and prairies between the Missouri and upper Mississippi rivers (Wedel 1974:165).

The Teton band moved south and westward, briefly occupying the Lake Traverse area before moving into the Missouri River Valley. This band was followed by the Yankton and Yanktonai bands. Eventually, the Santee bands moved southward, abandoning the northern lake area. The Sissetons

and Wahpetons moved to the Minnesota River Valley and adjoining plains. The Wahpekutes moved onto the prairies south of the Minnesota River. The Mdewakantons settled around the mouth of the Minnesota River, eventually occupying the lower Minnesota River and the area along the Mississippi River from its junction with the Minnesota to the mouth of the Upper Iowa River.

It has been suggested that the Santee Dakota were forced out of their old homelands by the Chippewa (Robinson 1904; Hickerson 1962, 1965, 1970, 1974). As interpreted by Hickerson (1962, 1965, 1970, 1974), Chippewa-Dakota relations prior to 1736 were basically peaceful. The Chippewa, acting as middlemen, controlled the fur trade in central Minnesota and western Wisconsin and supplied the Santee Dakota with French merchandise in exchange for furs and hunting privileges in Dakota territory. Supposedly, when the French trade frontier expanded to the Santee Dakota territory, the Chippewa no longer had access to game areas and trade fur. As a result, warfare erupted in 1736 as the Chippewa attempted to expand into new areas and eventually forced the Dakota to abandon the woodlands of central Minnesota. Holzkamm (1983), in countering Hickerson's interpretations, has pointed out that Chippewa-Dakota relations from 1679 to the early nineteenth century were generally hostile. Thus, Chippewa middleman relations with the Dakota would have been severely restricted. In fact, the Santee Dakota were able to maintain access to European trade goods throughout this period without exclusive reliance on Chippewa middlemen. Sources used by the Dakota to furnish them with trade goods included European trading posts, unlicensed traders without established trading posts, and non-Chippewa Indian middlemen (Holzkamm 1983:228).

Anderson (1980), in addition to accepting Hickerson's interpretations, has suggested that Dakota population movements were also affected by the European fur trade. Plains bison hunting was emphasized during periods of fur trade decline, while woodland resources were exploited during periods of fur trade prosperity resulting in conflict with the Chippewa (Anderson 1980:18-19, 28-30). These views are disputed by Holzkamm (1983) who sees Santee Dakota population movements "as a means of utilizing involvement in the European fur trade to participate in the Plains equestrian bison hunting economy" (Holzkamm 1983:225). Involvement in the fur trade allowed the Santee Dakota to exchange trade goods for horses, an important element of the bison hunting economy, with the more western Dakota groups. As a result, increased orientation toward the Plains, especially among the Sissetons and Wahpetons, was due to increased participation in the fur trade. "In short, a supply of horses made Plains bison hunting a desirable subsistence pursuit for the Eastern Dakota; however, horses could best be obtained through participation in the Dakota trade fairs with a supply of trade goods. Thus, the Eastern Dakota found that an equestrian bison hunting economy on the Plains necessitated

participation in the European fur trade as well" (Holzkamm 1983:231).

Interaction in the fur trade had markedly altered the material culture of the Santee Dakota by the beginning of the nineteenth century. Bone and stone tools and weapons had been largely replaced by those of steel. Although many household utensils were still made of wood and bark, brass kettles had replaced the use of pottery. In addition, European cloth and trade blankets had begun to replace the use of skins. Despite an increasing dependence on materials of European manufacture, the religion and social organization of the Santee Dakota were largely unchanged at the beginning of the nineteenth century (Meyer 1967:20).

In the 1830's, the fur trade underwent a drastic change in the Plains that directly affected the Santee Dakota. Emphasis shifted from a reliance on beaver and small mammal furs to a reliance on bison robes. This change destroyed the Santee monopoly over European trade goods and undermined the economic basis for the Dakota trade fairs because it was easier and more economical to transport bison robes by steamboat on the Missouri River than to haul them overland and ship them through the Great Lakes. In addition, greater emphasis on bison robes probably resulted in a decline of the bison population in the prairie fringe of the Plains (White 1978:330-331). In 1800, bison ranged as far as southeastern Minnesota and eastern Iowa, but by the mid-1830's they were gone from most of Minnesota (Hickerson 1962:16; Woolworth and Woolworth 1980:80). These factors probably eventually induced some Santee Dakota groups to take an interest in horticulture (Holzkamm 1983:231).

Close relationships existed between the Sisseton and Wahpeton bands of Santee Dakota. As mentioned previously, the Sisseton and Wahpeton occupied the Minnesota River Valley above Shakopee, having major villages at Big Stone Lake and Lake Traverse by 1800. The Sisseton and Wahpeton, along with the other Santee bands, followed a seasonal cycle of subsistence activities. Although they were nomadic hunters much of the year, some Sisseton and Wahpeton groups had permanent villages consisting of bark houses. These villages were occupied during part of the spring and summer when corn was planted or harvested. The raising of corn was observed at or recorded for Lake Traverse, including an island in the lake, in the early nineteenth century (Pond 1908:342-343; Riggs 1918:535-536). Subsistence activities during the rest of the year consisted of hunting mammals and waterfowl, fishing, and gathering a variety of berries, roots, and tubers. In the course of these activities, a variety of habitats were exploited: lakes, streams, prairies, and deciduous forests.

Although the bison had moved westward, abandoning most of Minnesota by the mid-1830's, the Sisseton and Wahpeton

from the lakes Big Stone and Traverse area, due to their possession of horses, were able to pursue the bison onto the Plains. The majority of the Santee, though, were forced to shift their emphasis from bison to deer meat and hides. The hunting of deer within the prairie-forest border of Minnesota brought the Santee into conflict with the Chippewa.

By the late eighteenth century, the Chippewa occupied the coniferous forest of northern Minnesota and northwestern Wisconsin, and the Santee occupied prairie regions on the Minnesota and upper Mississippi rivers. Due to continuing Dakota-Chippewa hostilities, Hickerson (1962, 1965, 1970) has suggested that the prairie-forest ecotone functioned as a buffer zone between the two groups from about 1780 to 1850. "The buffer zone comprised territory on the frontiers between tribes which, except for communal drives, was normally unoccupied. Such lands could not be entered in safety except by war parties or large hunting parties prepared at a moment's notice for war" (Hickerson 1965:43).

In addition, the character and shape of the buffer zone extending diagonally (southeast to northwest) from the Chippewa River in west-central Wisconsin to the Red River Valley in western Minnesota, was influenced by the distribution of deer within the prairie-forest border (Hickerson 1965). In general, deer prefer open forests with a great variety of browse, shunning mature coniferous or broad-leaf forests, boggy areas, and grassy areas without tree cover. "In Minnesota the buffer zone coincides generally with the transition zone between biotic provinces and the areas of highest deer populations" (Watrall 1968:83).

Deer were an important element of the subsistence strategies of the Dakota and Chippewa. Maintenance of the buffer zone (i.e, warfare) acted as a deterrent to heavy hunting within the zone by Dakota and Chippewa. As a result, the supply of deer within it remained high, suggesting that the buffer zone was purposefully maintained as a reservoir for deer. "The effect of warfare, then, was the regulation and preservation of a supply of deer in and near the buffer zone for the use of Indians hunting in bands, often at great risk of their lives" (Hickerson 1965:62).

During the French and Indian War (1756-1763), the Santee Dakota sided with the French. Having lost the war, France ceded her possessions east of the Mississippi to England and those to the west, including the Lake Traverse region, to Spain. As a result, the Santee Dakota had extensive contact with a different European power, England. During the American Revolution, the Santee were allied with the British and participated in the conflict along the central Mississippi Valley. In 1783, the United States acquired all territory east of the Mississippi. In 1800, Spain ceded the territory of Louisiana to France. Although the United States acquired this territory from France as a result of the Louisiana

Purchase of 1803, the Santee continued to be influenced by the British and French traders who carried on their operations much as they had prior to that time. It was several years before the United States began to establish its sovereignty over the territory encompassing the Lake Traverse area. During the War of 1812, the Santee Dakota were once again allied with the British and helped the British capture Mackinac. "The outcome of the War of 1812 had not induced the Indians automatically to shift their allegiance from England to the United States. Many of the fur traders, especially those in the employ of the American Fur Company, were British in sympathies,..." (Meyer 1967:36).

From colonial times there was a steady and increasing pressure by whites on Indian-claimed lands. The cession of some Santee Dakota lands as the result of the treaties of 1830 and 1837 did not directly affect the Dakota at Lake Traverse, but the Treaty of Traverse des Sioux in 1851 had a profound effect on Sisseton and Wahpeton Dakota. This treaty provided for the cession of all Upper Sioux (Sisseton and Wahpeton) lands in present-day Minnesota and a small portion in present-day South Dakota and authorized the payment of annuities to them. An important article, establishing a reservation extending 16 kilometers (10 miles) on each side of the upper Minnesota River from Lake Traverse to the Yellow Medicine River, was later stricken out by the U.S. Senate, but the Upper Sioux were temporarily assigned to this reservation. A similar treaty, the Treaty of Mendota, was signed by the Lower Sioux (Mdewakanton and Wahpekute). Their reservation extended along both banks of the Minnesota from the Yellow Medicine River to the Little Rock River near New Ulm, Minnesota (Meyer 1967:78-89). In effect, these treaties reduced the Santee Dakota to eventual, complete dependence on the government.

The Sisseton and Wahpeton considered the land assigned to them acceptable as a reservation since it included their old village sites (Carley 1976:3). Waneta, a Yanktonai chief, had a village located on the northwest shore of Lake Traverse. Burning Earth, a Sisseton chief, had a village at the south end of the lake near the Little Minnesota River. At least two villages were situated on the east side of Lake Traverse, one near the center and one near the northeast end (Riggs 1839, in Woolworth 1981:131-132).

Standing Buffalo, a Sisseton chief, had a village reportedly located where Sam Brown's log house now stands in present-day Sam Brown Memorial Park on the western edge of Browns Valley, Minnesota (Allanson 1958:6). Although Standing Buffalo refused to join Little Crow in the Dakota Uprising of 1862 (Meyer 1967:118), he lost his crops, land, and village when the government confiscated all Dakota lands in Minnesota as a result of the outbreak. He fled with his village onto the plains of Dakota Territory, eventually moving to Canada where he was killed by a party of Crow in 1866 (Robinson

1904:347).

Sweet Corn, a Sisseton chief who supposedly earned his name after developing a particularly sweet and succulent variety of corn (Anonymous 1966, Sec 3:7), had a village, that included a large garden area, on the northwest shore of Lake Traverse, north of Jim Creek near the present-day Kaufman Resort (Muellenbach 1958:35-37). A dugout, located on a hilltop west of the village, was used as a lookout post for detecting approaching Chippewa warriors. A ditch connecting the dugout to the village allowed sentries to descend the hillside undetected to warn the village of approaching enemy warriors (Kieserling 1970:22). During the Sisseton and Wahpeton claims trials Sweet Corn was accused of participating in the siege of Fort Abercrombie during the Dakota Uprising (Carley 1976:56). Sweet Corn died in 1888 and his grave, marked by a monument, is situated on a hillside overlooking the Kaufman Resort (Kieserling 1970:229).

Believing that individual ownership of land was absolutely essential for "civilizing" the Santee Dakota, a proposal was advanced to allot an 80 acre tract to each family head or other adult. It was assumed that they would eventually qualify for fee patents to the allotments and become citizens. Since only the portion of the reservation south of the Minnesota River was required in this scheme, the Santee were forced to sign a treaty in 1858 ceding that portion of the reservation north of the Minnesota River and east of Lake Traverse, nearly a million acres, for a price to be set by the U.S. Senate. Finally, in 1860, after a two year delay, the Santee were authorized a payment of 30 cents an acre for the relinquished land, but due to the usual traders' claims, they actually received little money (Meyer 1967:103-104).

The various treaties engendered in the Santee disillusionment, declining respect, and bitterness toward the government. Several factors combined to culminate in the Dakota Uprising of 1862, resulting in much bloodshed along the Minnesota River Valley (Carley 1976:5; Meyer 1967:111-115). The failure of the military to capture and punish Inkpaduta and his small band of Wahpekute for the murders of over 30 people in 1857 in the Lake Okoboji area of Iowa and the government's subsequent attempt to hold the Santee responsible for Inkpaduta's capture lessened the Dakota's esteem for the whites. In addition, the Santee were aware that many young men had left Minnesota, weakening the state's defenses, to fight in the Civil War. A crop failure in 1861 resulted in near-starvation during the 1861-62 winter. The Santee were feeling increased pressure from white settlements near and even on the reservation. The most important immediate cause of the uprising was probably the delay in the arrival of the annuity goods and cash (Carley 1976:5).

Although most of the Sissetons and Wahpetons did not

participate in the uprising, they fled from the advancing military force commanded by General Henry H. Sibley and spread out over the plains of Dakota Territory. After following a nomadic life for several years, the majority gradually gathered on the Coteau des Prairies, just west of the Lake Traverse-Big Stone Lake area, near Fort Wadsworth which was established in 1864. Since the Sisseton and Wahpeton had generally remained loyal to the U.S. Government during the uprising, a treaty signed in 1867 established a triangular-shaped reservation between Lake Traverse and Fort Wadsworth for these Dakota bands. The Sisseton Reservation, also known as the Lake Traverse Reservation, encompassing 918,770.58 acres, had its apex at Lake Kampeska, near present-day Watertown, South Dakota, and its base along, but not parallel to, the present North Dakota-South Dakota border. The west shore of Lake Traverse formed a portion of the reservation's eastern boundary (Meyer 1967:198-199, 216).

By the 1880's, white settlers were pressuring the government to open the reservation to settlement. The Sisseton Reservation had been intact for 20 years when the Dawes Act became law in 1887. This act authorized the allotment of any reservation when the Indians were deemed ready to take on the responsibilities of citizenship. "Since the Sissetons were by this time largely self-supporting and were living under a fairly complex system of reservation government, it was natural for their reservation to be chosen as one of the first to undergo the experiment" (Meyer 1967:216).

Terms were reached whereby each member of the Sisseton and Wahpeton bands was to receive an allotment of 160 acres and the balance of the reservation was to be purchased by the United States Government at $2.50 per acre and opened for settlement. After the allotment was completed in 1889, the remaining 573,872.26 acres were opened for settlement at 12 P.M., April 15, 1892. Allotment and the opening of the reservation resulted in an immediate decline in farming by the Indians and a corresponding rise in the leasing of land to whites. Cash payments for ceded lands were usually ill-advisedly used. Eventually, the majority of the Indian population was once again reduced to a state of poverty (Meyer 1967:216-219).

Euro-American Period (Post-1640): Fur Trade

The earliest Euro-Americans to contact the Indians of the Lake Traverse area were the fur traders. Initially, these were the French. One aim of the fur trade was the occupation of "the newly discovered continent in order to exploit its human and natural resources at a new level of technological development in such fashion as to increase the wealth of Europe" (Holder 1955:3). Although it was not an equal partnership, each group held the upper hand at one time or another. Success required the cooperation of both parties. The Indians provided labor for the production and

transportation of furs, principally beaver and muskrat. In return, the traders mainly supplied products of the metal and textile industries (i.e., axes, guns, kettles, beads, cotton and woolen cloth, etc.). During initial penetration of a region, the traders depended on the cultural contributions of the resident native populations. Indian modes of transportation, housing, clothing, and subsistence were adapted to the traders' needs. Generally peaceful relations prevailed since aggression would have deprived the Indians of trade goods and the traders of furs and provisions (Holder 1955:3; Ray 1974:xi).

Initially, the Dakota bands did not have direct access to European goods. They depended on Indian middlemen, such as the Ottawa, Huron, Fox, and Chippewa (Innis 1956:54). At this time, the 1660's, the fur trade of the upper Mississippi Valley was firmly controlled by the Indians. "Tribes as middlemen resented attempts to destroy their monopoly position" (Innis 1956:16). These middlemen controlled the price of beaver and the flow of European goods to the Indians of the interior. "Indian middlemen were able to exercise greater bargaining power over more remote tribes with the use of European weapons. Consequently, they were extremely jealous of any attempt of the French or the Dutch to trade guns with these remote tribes" (Innis 1956:21). The monopolies were broken as the traders were able to supply guns to the more remote tribes, such as the Dakota.

With the establishment of fur trading posts, beginning in the 1680's, by the French in the upper Mississippi Valley and the advent of the coureurs de bois (traveling traders), the Dakota had direct access to European goods. As mentioned previously, the involvement of the Sisseton and Wahpeton in the fur trade allowed them to participate in the Plains equestrian bison hunting economy. They participated in the Dakota trade fairs on the James River, supplying trade goods to the more western Dakota bands in exchange for horses (Holzkamm 1983).

As mentioned previously, interaction in the fur trade markedly altered the material culture of the Santee Dakota. They adopted articles of European manufacture that were improvements on native-made ones or that were more efficient for doing things they had always done (Gilman 1974:4; Innis 1956:17-20). In addition, since increasing emphasis was placed on the beaver, European articles were in demand which made it possible to spend more time in obtaining beaver pelts (Innis 1956:20). Native-made stone, bone, and wooden tools and weapons were replaced with items such as fire steels, metal tools, steel traps, and guns. Pottery and basketware were replaced by brass and iron utensils. Cotton and woolen cloth, glass beads, and vermillion paint, as well as other decorative materials, were also in demand. The changes that occurred were adaptations, by the Santee Dakota and other American Indian groups, of elements of Euro-American culture

rather than a destruction or abandonment of their own cultures (Gilman 1974:4).

During the French period the boundary between the colony of Louisiana and Canada was never determined (Gilman 1974:8), and this was later to cause problems between the British and the United States. France officially controlled the fur trade in southern Canada and present-day Minnesota until the end of the French and Indian War in 1763 when her holdings were divided between Spain and England. Although Louisiana legally became a Spanish colony in 1762, the French kept effective control of it until 1769 (Gilman 1974:8).

Gradually, the trade of the Lake Traverse area came under the control of the British. In 1783, the Treaty of Paris ended the American Revolution and the North West Company was also formed. The North West Company controlled the country beyond Lake Superior by the late 1780's. In the 1790's, independent traders, such as Robert Dickson, working out of Prairie du Chien and finding themselves shut out from the trade of this region, began to turn their attention toward unexplored areas, such as the headwaters of the Minnesota, Des Moines, and Big Sioux rivers within Spanish territory. These traders had access to a steady supply of cheap, duty-free English goods (Gilman 1974:10-11).

The Lake Traverse area was well-stocked with beaver, otter, marten, and muskrat, making it a very desirable fur trading location. Robert Dickson established the first fur trading post on Lake Traverse in the early 1790's (Lavender 1964:35) or about 1800 (Nute 1930:379). This post was situated on the east side of the lake. The post served as his home. It was opposite the favorite campsite of his brother-in-law, Red Thunder, a Yanktonai chief (Tohill 1925:333). He married To-to-win, the sister of Red Thunder, in 1797. This post became Dickson's trading headquarters. From this location he carried on a substantial business with Santee, Yankton, Yanktonai, and Teton Dakota. By 1812, the fur trade with the Dakota and Chippewa in Minnesota, except for the northern part of the present state, was controlled by Robert Dickson and his associates (Tohill 1925:334).

Sensing that profits would be threatened by Americans pushing up the Missouri River, the firm known as Robert Dickson and Company was organized in 1805. In addition to Dickson, this organization included Allen Wilmot, Murdoch Cameron, James Aird, Jacob Franks, and possibly, Joseph Rolette. Trading posts were established with the purpose of securing control of the trade of the best hunting grounds in the Northwest (Tohill 1928:23-25; Gilman 1974:11). "Their trading posts occupied a belt of territory extending from the eastern shore of Lake Michigan westward to the Missouri, with the Fox, Wisconsin, Mississippi, Minnesota, and James rivers running through its midst, a thread of communication and a bond of union" (Tohill 1928:25). The enterprise failed due,

primarily, to the heavy burden of old debts and was absorbed by the Michilimackinac Company in 1807 (Tohill 1928:26; Gilman 1974:12).

The Michilimackinac Company was formed in December, 1806. At that time, a document was signed that was designed to reduce competition between the new firm and the North West Company. Boundary lines were established separating the trade territories of the companies. As part of this boundary, the North West Company was not to extend its territory farther south than the confluence of the Sheyenne and Red rivers. In addition, it was not to attempt trade with the Dakota. The Michilimackinac Company was not allowed to establish posts on the Red River. Each company also agreed not to interfere with the trade of the other (Tohill 1928:32; Gilman 1974:12).

The future of the Michilimackinac Company was decided by forces beyond its control. Although the provisions of Jay's Treaty of 1796 granted Americans and Canadians the right to trade within each other's territory, relations between the United States and Britain worsened after the purchase of the Louisiana Territory in 1803 by the United States. In 1805, General James Wilkinson, governor of upper Louisiana, "proclaimed the territory west of the Mississippi closed to foreign traders" (Gilman 1974:13). In addition, only merchandise manufactured in the United States could be carried into the territory and all agents and interpreters had to swear allegiance to the United States. This proclamation was a reaction to a fear that British traders would incite the Indians against the Americans. It was believed that the United States could control the Indians by controlling the trade. Although the proclamation was not strictly enforced, due to the absence of a military force on the upper Mississippi, it was successful in disrupting British trade in the region. In addition, as a result of the Non-intercourse Act of 1810, supplies could not be brought legally into the United States. Consequently, the British traders, including Dickson, resorted to smuggling (Tohill 1925:334, 1928:34-35; Gilman 1974:12-13).

In order to circumvent the United States' embargo on Canadian goods the Michilimackinac Company merged with the American Fur Company, which was founded in 1808 by John Jacob Astor, under the name of the South West Company (Tohill 1928:37; Gilman 1974:13). The sphere of operations of the new company extended from the Great Lakes westward but excluded the territory beyond the upper Missouri. The partnership did not last. An act passed in 1816 barred all foreigners from the American Indian trade but American trading firms were later allowed to employ French Canadian voyageurs. The exclusion of Canadian traders undoubtedly discouraged the Canadian partners of the South West Company. Also, the resources of the Canadian partners were strained by low prices and high costs due to the Napoleonic Wars in Europe and increased competition with the Hudson's Bay Company. As a

result, the Canadians sold their half of the partnership to Astor in 1817 and the South West Company became the American Fur Company (Lavender 1967:33-35).

Conditions in the fur trade (e.g., embargoes, tariffs, Wilkinson's proclamation) contributed to the outbreak of the War of 1812. The British traders foresaw doom if the United States retained control of the Northwest, as reflected in the decrease in Indian hunting grounds and the advance of settlers. "There is little solid evidence that the fur trade as a way of life for Indian people could not have continued, with some modifications, if it had been possible to guarantee them possession of the land and its resources" (Gilman 1974:13).

Many of the causes of hostility between the Americans on one hand and the British traders and Indians on the other were due to the differing American and English land policies. It was expected by the Americans that all Indian lands would ultimately be opened for settlement. Consequently, the fur trade, which was of interest to only a small number of people, was only a temporary stage in opening the country for settlement. The Americans were generally ignorant of Indian languages, customs and beliefs, and they assumed a superior attitude toward the Indians (Tohill 1928:45-46).

The British desired to maintain the Indian hunting grounds as a source of furs for foreign markets. The Indians concurred with this policy since it allowed them to keep their ancestral homes and to engage in their accustomed pursuits. According to this policy, there were no extensive contacts between the Indians and the whites. Except for a few small British garrisons, only the traders and their engages would enter Indian territory. In addition, the British (and before them, the French) traders fostered friendly relations between themselves and the Indians by intermarrying with the Indians with whom they traded. As a consequence of living among the Indians, the British traders gained a familiarity with Indian customs and languages which the Americans lacked. Under such circumstances, the British were successful in securing the loyalty of the Indians (Tohill 1928:45-46; Parker 1951:114).

While the Americans hoped to keep the Indians neutral, the British solicited the loyalty of the Indians in the event of war with the United States by supplying the Indians with guns, ammunition, and presents (Tohill 1928:47). When war between Great Britain and the United States broke out in 1812, the Indians of the Northwest sided with the British. Dickson was very instrumental in keeping most of the Indians of the Northwest firm in their alliance with the British. An Indian force, consisting of Dakota and several other tribes, was commanded by Dickson during the capture of Fort Mackinac (Michilimackinac). Prominent Dakota from the Lake Traverse area who participated in this battle included the

aforementioned Red Thunder and his son Waneta, Dickson's nephew (Parker 1951:126). Dickson commanded the Indians in several other battles during the war. Due to his war activities, Dickson's trade was destroyed (Tohill 1925:339).

The Treaty of Ghent, signed in late 1814, ended the war. Land was not restored to the Indians and the boundaries were left as they had been previous to the war. In addition, a law passed in 1816 prohibited the British and other foreigners from carrying on trade within American territory, although exceptions were later allowed (Gilman 1974:15; Tohill 1929:183-184). The British, however, were reluctant to accept this prohibition and found a way around the law. They employed an American, obtained a license in his name, and had the goods invoiced to him. Then, the British trader accompanied the American as an interpreter until they were beyond the Indian agencies. At this point, the trader paid the American, assumed control of the property and carried on business as usual (Holcombe 1908:54). The facility for enforcing the law came with the building of Fort Snelling in 1819 at the junction of the Mississippi and Minnesota rivers (Kieserling 1970:113). "It was not until 1823 that the British fur company agents left the area of Lakes Traverse and Big Stone and withdrew northward to Canada" (Parker 1951:147).

In addition to Dickson's trading post, several trading companies had posts located at Lake Traverse. Joseph Renville, the son of a Dakota mother and a French father, was prominent in the fur trade of the area. After a brief sojourn in Canada following the War of 1812, in which he joined Dickson against the Americans, Renville traded at the source of the Red River (Lake Traverse) for the Hudson's Bay Company until 1822 when he left its employ. The Hudson's Bay Company abandoned the post, which was probably located near Dickson's, in 1823. Since this post was located on American soil, he was compelled to become an American citizen and obtain a trader's license in order to continue trading in the area. Consequently, he organized the Columbia Fur Company in 1822 (Ackermann 1931:232-235; Nute 1941:282-283). He was joined in this endeavor by several other veterans of the Canadian trade, including Kenneth McKenzie and William Laidlaw. "As the laws of the United States forbade foreigners to engage in the fur trade within its boundaries on their own account, the organization was legalized by bringing in certain citizens of the United States, among them Daniel Lamont, and placing it under their name. The legal title of the firm was Tilton and Company,..." (Chittenden 1954:323), but it was always known as the Columbia Fur Company.

Its principal establishment, built in 1823 and known as Fort Washington, was situated on the southeast shore of Lake Traverse (Nute 1930:379). The post, which was surrounded by a stockade, was about 200 yards from the lake shore and was about 100 feet square. From this location it engaged in

trade over a vast tract extending as far west as the Missouri River (Ackermann 1931:236). Stephen Long's expedition was entertained at this post by agents Laidlaw and Hess in 1823 (Kane et al. 1978:169-173).

Since the Columbia Fur Company was perceived as a threat by the American Fur Company which was endeavoring to monopolize the Northwest trade, the American Fur Company bought out its competition in 1827 and took over operation of the post until it was abandoned in about 1838. In 1834 Henry H. Sibley took charge of the company's department in the upper Mississippi area known as the Sioux Outfit. Renville met with Sibley and Joseph Rolette in 1835 and agreed to manage the post at Lake Traverse, although by this time Renville had shifted his operations to the Lac qui Parle area. Joseph R. Brown, a prominent Minnesota trader and pioneer, was sent to the post to prevent losses in the trade but the post continued to lose money and was finally abandoned in 1838 (Ackermann 1931:236-237).

Prior to the union of the Northwest and Hudson's Bay companies in 1821, the Northwest Company established a post on or near Lake Traverse in 1820. Duncan Graham was in charge of the post during its brief history. He had previously traded in the area under the employ of the Hudson's Bay Company (Nute 1941:282-283; Parker 1951:186-188).

Records of Lake Traverse fur trading posts in operation after 1845 are obscure, if they did business at all. This is not to say fur trading in the area came to a halt. Edward D. Neill (1882:987) describes the fur trade of this region in the 1860's as "immense". In 1870, more than 200,000 pelts, mostly muskrat, were bought and sold in the vicinity of Browns Valley (Barrett 1881:13). In the 1870's, however, the fur trade slackened. The influx of settlers crowded the already diminished population of fur bearing animals, and styles in Europe began to put less emphasis on fur.

It is clear from the foregoing discussion that several trading posts were present on the east side of Lake Traverse, but considerable confusion exists as to their number and locations (Figs. 12-14). Dickson's post has several reported locations. According to Nute (1930:379), it was situated about five miles north of present-day Browns Valley, Minnesota on lot 4 (Fig. 13)(C,W,SE) in section 2, T125N, R49W. Tohill (1925:333) concurs, stating that it was opposite the favorite campsite, below the mouth of Jim Creek, of his brother-in-law, Red Thunder. It is further stated that the post was about 200 yards from the lake shore and was about 100 feet square (Tohill 1928:14-15). According to Allanson (1958) and the Minnesota Archaeological Site Files, this location is actually the site of Fort Washington, the Columbia Fur Company's post. They place Dickson's post on a hill in the northeast corner of section 28 and the southwest corner of section 22, T126N, R48N (Fig. 14). Based on

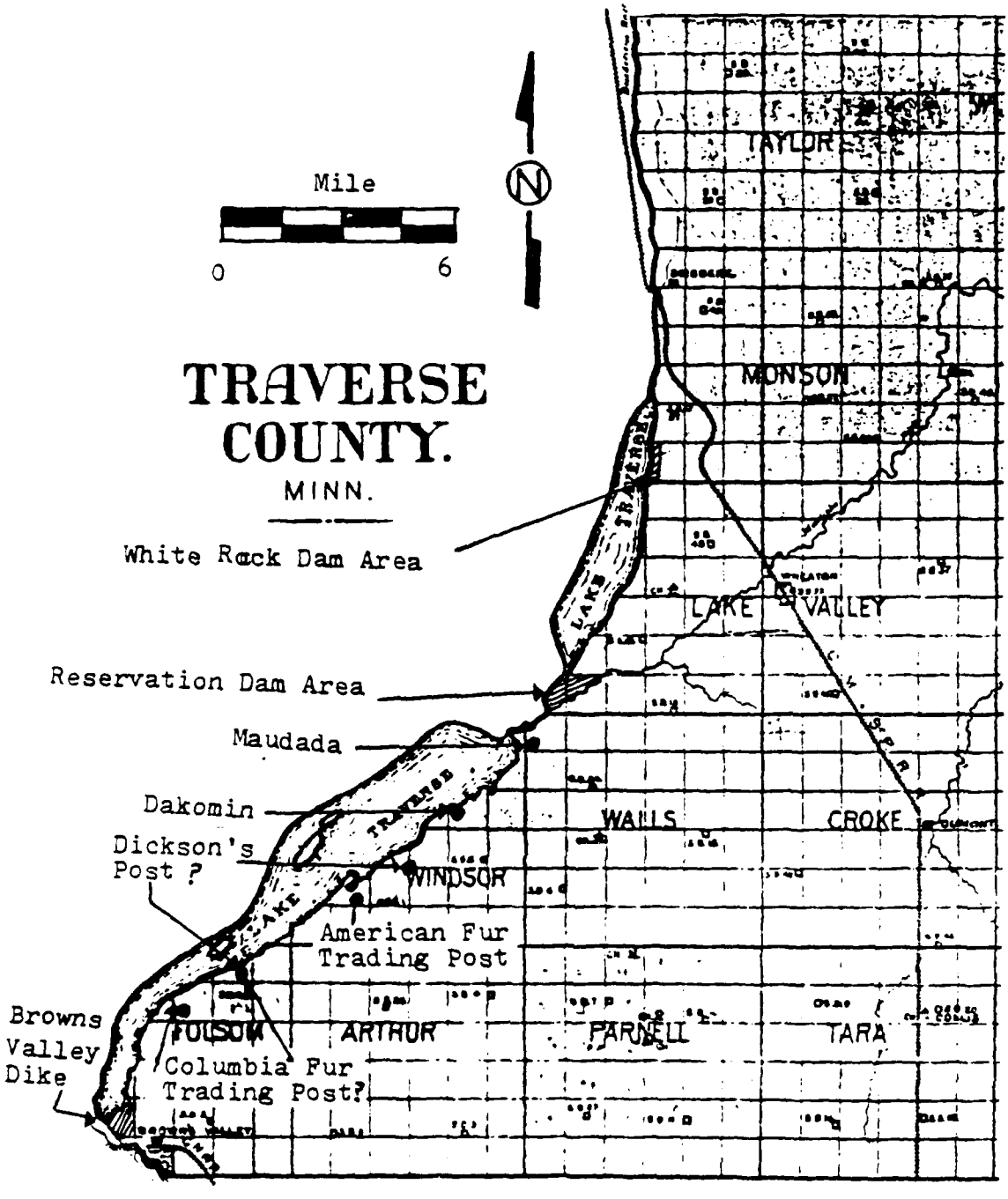


Figure 12. Index map of Traverse County, Minnesota, showing locations of Townships.

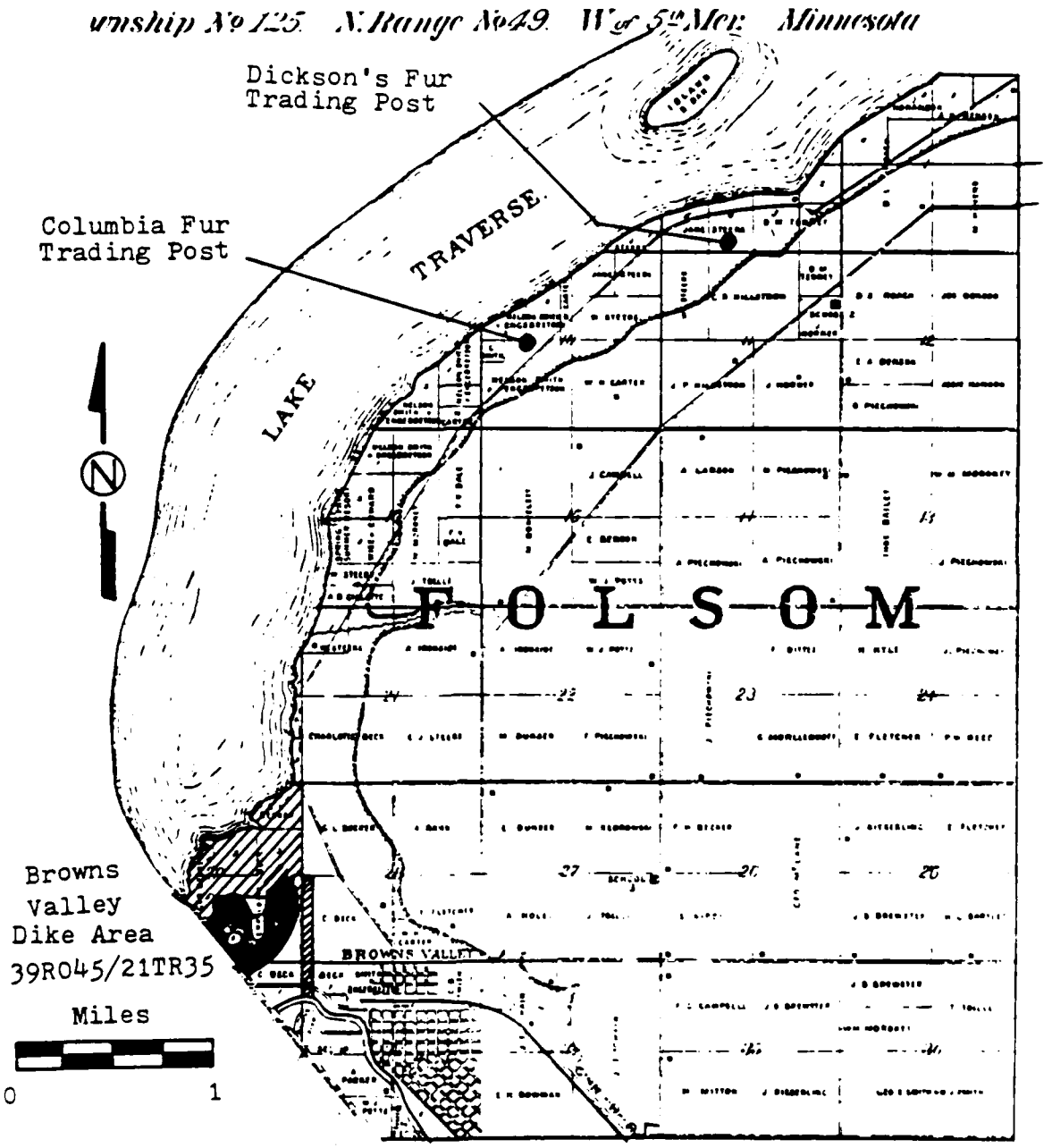


Figure 13. Traverse County atlas map of Folsom Township, ca. 1902.

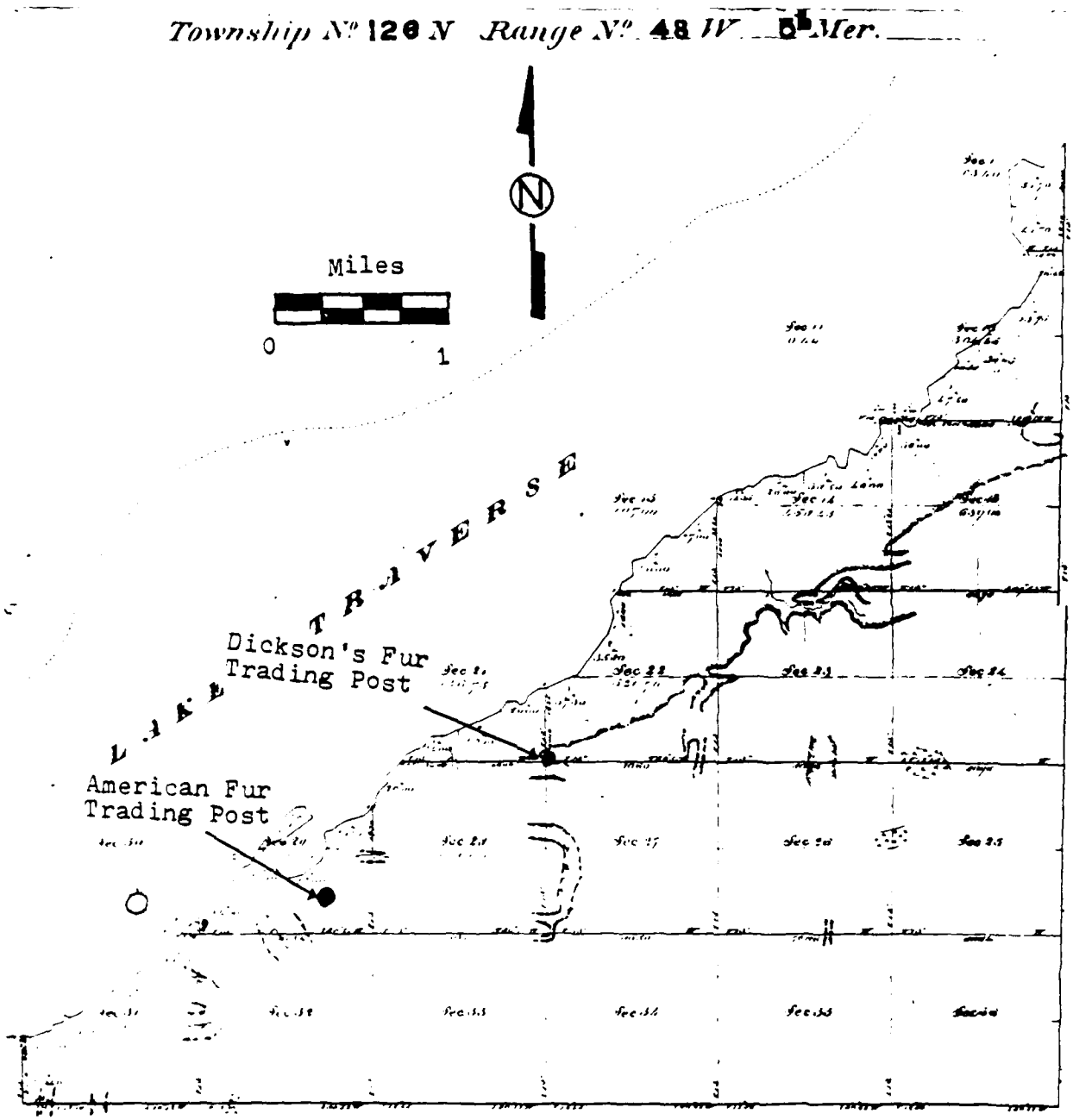


Figure 14. Government Land Office map of Minnesota, ca. 1870. T126N, R48W.

available information, none of the trading posts have been assigned site numbers and none are located within the present project's survey boundaries.

Selkirk Colony

Thomas Douglas (1771-1820), the fifth Earl of Selkirk, wanted to establish a colony in present-day Canada for Scotch and Irish peasantry who were suffering severe hardships in their homelands. After an unsuccessful attempt to interest the British government in the project, he turned his attention to the Hudson's Bay Company and became its principal stockholder (Pritchett 1924:404). In 1811, the Hudson's Bay Company granted Selkirk a district to be known as Assiniboia, about 274,540 square kilometers (116,000 square miles) including the entire valley of the Red River of the North, for establishment of an agricultural colony (Listenfelt 1913:243-244; Robinson 1966:63).

This was not an altogether altruistic move on the part of the Hudson's Bay Company. The company recognized that an agricultural community, producing food supplies, could relieve them of the great expense of importing food from Britain. Moreover, it would encourage retiring traders to settle in the area and spend their money with the company rather than to return to England. Hopefully, it would also become a convenient labor pool for the company (Robinson 1966:63). The first group of colonists arrived in the summer of 1812.

Although the portion of Selkirk's grant, including the Lake Traverse area, located south of the 49th parallel is presently part of the United States, Selkirk had reason to believe that it was British territory. Technically, the upper Red River Valley, including Lake Traverse, was never part of the territory of Louisiana as defined by La Salle, the French explorer, and purchased by the United States in 1803. Louisiana Territory consisted only of the lands drained by the Mississippi River and its tributaries. The Red River of the North is not part of the Mississippi drainage system. Rather, it is within the Hudson Bay drainage basin. Based on its charter of 1670, the Hudson's Bay Company had ownership of the land drained by the rivers flowing into Hudson Bay (Tohill 1925:340-341, 1929:195-197; Listenfelt 1913:236). Therefore, strictly speaking, Lake Traverse and the rest of the Red River Valley were actually within British territory. It was not until the convention of October 20, 1818, establishing the 49th parallel as the boundary between the United States and Canada as far west as the Rocky Mountains, that the Lake Traverse area officially became part of the United States (Tohill 1925:341).

Since the boundary was thought to be the height of land between lakes Traverse and Big Stone prior to the convention of 1818, Selkirk proceeded with his plans for his colony with

this boundary in mind. He was joined in his efforts by Robert Dickson in about 1816. Selkirk wanted Dickson to engage in fur trade within the limits of Selkirk's grant on the Red River. Goods were to be purchased from the Hudson's Bay Company and furs were to be sold to the company. The goods were hauled up the Red River Valley "on carts built for the purpose, the forerunners of the St. Paul-Pembina carts of later days" (Tohill 1925:341).

Since the colony that Selkirk founded was located near the confluence of the Assiniboine and Red rivers in present-day Manitoba, the Lake Traverse area was, in general, only indirectly involved in the activities of the colony. In 1820, three Mackinaw boats carrying supplies for the colony traveled from Prairie du Chien via the Mississippi, the Minnesota, and Big Stone Lake. Then the boats were dragged and floated across the marshy divide to Lake Traverse and the journey continued to the colony via the Red River. This is the only instance on record of heavy articles having been transported the entire distance from Prairie du Chien to the Red River settlements by boat (Barrett 1881:6; Gilman et al. 1979:4). In addition, several herds of cattle destined for the colony passed through the Lake Traverse area (Tohill 1929:192-193; Gilman et al. 1979:2, 4).

Due to the harsh climate, floods, drought, and plagues of grasshoppers, a southward-bound migration of colonists from the Red River Settlement commenced in 1821, climaxed in 1826, and continued into the 1830's and 1840's. These discouraged settlers often stopped at the Lake Traverse fur post on their way to the gentler climate of the Mississippi Valley (Gilman et al. 1979:6-7). Despite this southward migration, the population of the settlement actually had grown, agriculture had become well-established, and Selkirk's Red River Settlement became the nucleus of present-day Winnipeg, Manitoba.

Explorations

An American military and scientific expedition commanded by Major Stephen H. Long of the Topographical Engineers in 1823 (Kane et al. 1978) was the first official American venture into the valley of the Red River of the North. This expedition, traveling up the Minnesota River and down the Red River of the North to Fort Douglas in Canada, had as its objectives the investigation of the character and customs of the Indians and the description of the country along its route. In addition, the determination of the 49th parallel (the international boundary designated by the convention of 1818) on the Red River was another objective since it was believed that a part of the Red River settlements (Selkirk Colony) and the Hudson's Bay Company post at Pembina (now in North Dakota) were south of the border (Kane et al. 1978:15-16).

The expedition party included William H. Keating, mineralogist and geologist; Thomas Say, naturalist and antiquary; Samuel Seymour, landscape artist; and James E. Colhoun, Long's assistant. They were joined by Giacomo C. Beltrami, a self-imposed Italian exile, who traveled with the expedition from Fort St. Anthony (Fort Snelling) to Pembina. Guides and interpreters during various stages of the journey included Joseph St. Peter Le Sellier, Augustin Rocque, Joseph Renville, and Charles Gasparde Brousse. At one point the party consisted of 32 men, its maximum size.

The expedition visited the Columbia Fur Company's major post, Fort Washington, on the eastern shore of Lake Traverse in late July. A Dakota encampment was near the fort. During their brief sojourn at the fort they were invited to a feast by Waneta, the aforementioned well-known Yanktonai chief. Seymour drew separate sketches of Waneta and the fort with its natural surroundings. Long also learned that a band of Yanktonai consisting of more than 100 lodges was engaged in a bison hunt near the route his expedition had yet to travel. Before leaving the post, Long purchased provisions and engaged six carts for the journey to Pembina (Kane et al. 1978:169-173).

The expedition ascended the bluffs and continued its journey on the east side of Lake Traverse. Occasionally, bison trails and bison bones were noted. Before leaving the Lake Traverse area some bison were sighted near the Mustinka River and several were killed (Kane et al. 1978:173-174, 312-313).

Joseph N. Nicollet (1786-1843), a French scientist, geographer and cartographer, came to the Big Stone Lake-Lake Traverse area on scientific explorations in 1838 and 1839 (Bray and Bray 1976). He was accompanied on these expeditions by John C. Fremont who later gained fame exploring the Rocky Mountains in 1842 and 1843. The purpose of the expeditions, which were under the auspices of the Bureau of Topographical Engineers, was the collection of data for a map of United States territory between the upper Mississippi and Missouri rivers and the Canadian border. This included the previously unmapped Coteau des Prairies. This information was necessary for planning the future exploration and settlement of the region and the rest of the West. Nicollet's resulting map, "Hydrographical Basin of the Upper Mississippi River", published in 1843 by the United States government was so accurate that it was used as the basis for succeeding maps until the advent of modern surveys.

During his journeys Nicollet recorded ethnographic information on Dakota culture. "In addition he recorded a large number of words and phrases in the Dakota language and prepared a grammatical description of Dakota, as well as several vocabularies" (DeMallie 1976:250). A Sisseton village, whose chief was Burning Earth (mentioned

previously), was noted by Nicollet on the southeast side of Lake Traverse. He also indicated Waneta's Yanktonai village was on the west side of the lake (DeMallie 1976:254, 256). Both village sites are outside the present project's boundaries. Nicollet met Waneta on several occasions during the course of his travels in the Dakotas and Minnesota. Nicollet saw the land over which he traveled "as the Indian saw it, and he was the last of his kind who was able to communicate such an experience to us" (Bray and Bray 1976:41).

Historic Trails and Transportation

The development of the network of trails commonly referred to as Red River trails and their accompanying form of transportation, the Red River cart, was the result of the fur trade. The Earl of Selkirk was one of the first to envision a transportation and commercial link through which furs and supplies would flow between his colony and American settlements. Prior to its absorption by the American Fur Company in 1827, the Columbia Fur Company developed well-marked trails between the Mississippi and the Red rivers. The original Red River trails followed Indian paths along the rivers. Exactly when they developed into cart trails is difficult to ascertain (Gilman et al. 1979:1, 5, 43).

The carts used on these trails were made entirely of wood and the screeching of their wheels could be heard for miles. A number of changes in the design of the two-wheeled carts occurred over the years, although the basic design remained unchanged. The Red River cart, with its five-foot diameter wheels, was designed for a wide variety of travel conditions. It was easy to traverse bogs, buoyant at river crossings, strong on rocky terrain, and difficult to overturn. Depending on the terrain to be traversed, either an ox or a horse (usually an Indian pony) was harnessed to the cart. Later, mules were also used. An ox was stronger and better adapted to crossing marshes than a horse, although a horse was better on rocky or steep terrain (Gilman et al. 1979:15-16).

"The decade of the 1850s saw transportation and commerce over the Red River trails come into their own" (Gilman et al. 1979:14). The trains of carts and the trails over which they traveled brought furs, skins, pemmican, dried bison meat, moccasins, and skin garments from the Red River country to St. Paul. On the return north the carts carried staple groceries, tobacco, liquor, dry goods, clothing, tools, hardware, guns, ammunition, farm implements, and window glass. In addition, beginning in 1821 and peaking in 1826, a southern migration of dissatisfied settlers from Selkirk's Red River Settlement followed the trails to the Mississippi Valley (Gilman et al. 1979:6-7, 14).

The earliest Red River trail across Minnesota was the Minnesota Valley Trail which generally paralleled the Bois de

Sioux and Minnesota rivers from present-day Breckenridge, Minnesota to St. Paul and Mendota, Minnesota. The trail had several branches. "The western route followed the Bois de Sioux to the shores of Mud Lake (then called Buffalo Lake), crossed the sluggish Mustinka, and continued along a high ridge paralleling Lake Traverse,..." (Gilman et al. 1979:44)(Fig. 15). The cart trains sometimes picked up furs from the post at Lake Traverse and transported them to Mendota. The trail split at the southern end of Lake Traverse, one route on the northeast side of Big Stone Lake and one on the southwest side. The Minnesota Valley route was the principal Red River Trail throughout the 1840's and the early 1850's when it was supplanted by two shorter northerly routes, the Middle and Woods trails. In addition, most of the Minnesota Valley trails became government roads during the 1850's (Gilman et al. 1979:43-46).

Fort Wadsworth, located west of the south end of Lake Traverse (Fig. 16), was built in 1864 (Swanberg 1961:48). The Wadsworth Trail, a military trail, was established from St. Cloud on the Mississippi River to the fort in order to furnish the soldiers with supplies and equipment. Traders and settlers used the trail as well. The supplies to be taken over the Wadsworth Trail were brought up the Mississippi River by boat, unloaded at St. Cloud and taken by teams of horses, mules, and oxen through Sauk Centre, Gager's Station, Frisky's Grove, Graceville, and Browns Valley (where the Minnesota Valley Trail was crossed) on the way to the fort. A memorial marker located at the west end of Minnesota Highway 28 in Browns Valley is dedicated to the former trail. At the location of the marker, the ruts made in the trail are still visible going up over the hill into South Dakota.

In 1918 the Sioux Historic Trail was registered in the records of the Minnesota Highway Commission. It extends from St. Paul and Fort Snelling up the Minnesota River Valley to lakes Big Stone and Traverse, and down the Red River Valley to Pembina, North Dakota. The trail has a length of 720 kilometers (450 miles) from the Capitol of Minnesota to the northwest corner of the state (Upham 1923:1).

A trail, sometimes known as the Assiniboine Trail, extended between present-day Browns Valley and the Sheyenne River. The Dakota used this trail to travel between their hunting grounds and trading posts in Minnesota. A military expedition commanded by Henry H. Sibley camped at the location of Browns Valley for about a week and followed this trail in the summer of 1863 in pursuit of Dakota involved in the previous year's uprising (Wright 1927:35).

In 1865, a stage line was established from Fort Wadsworth, through Browns Valley, to Redwood Falls. The stage road that brought most of the early settlers into Browns Valley entered the valley from the top of the hill through present-day Valley View Cemetery (southeast corner of section

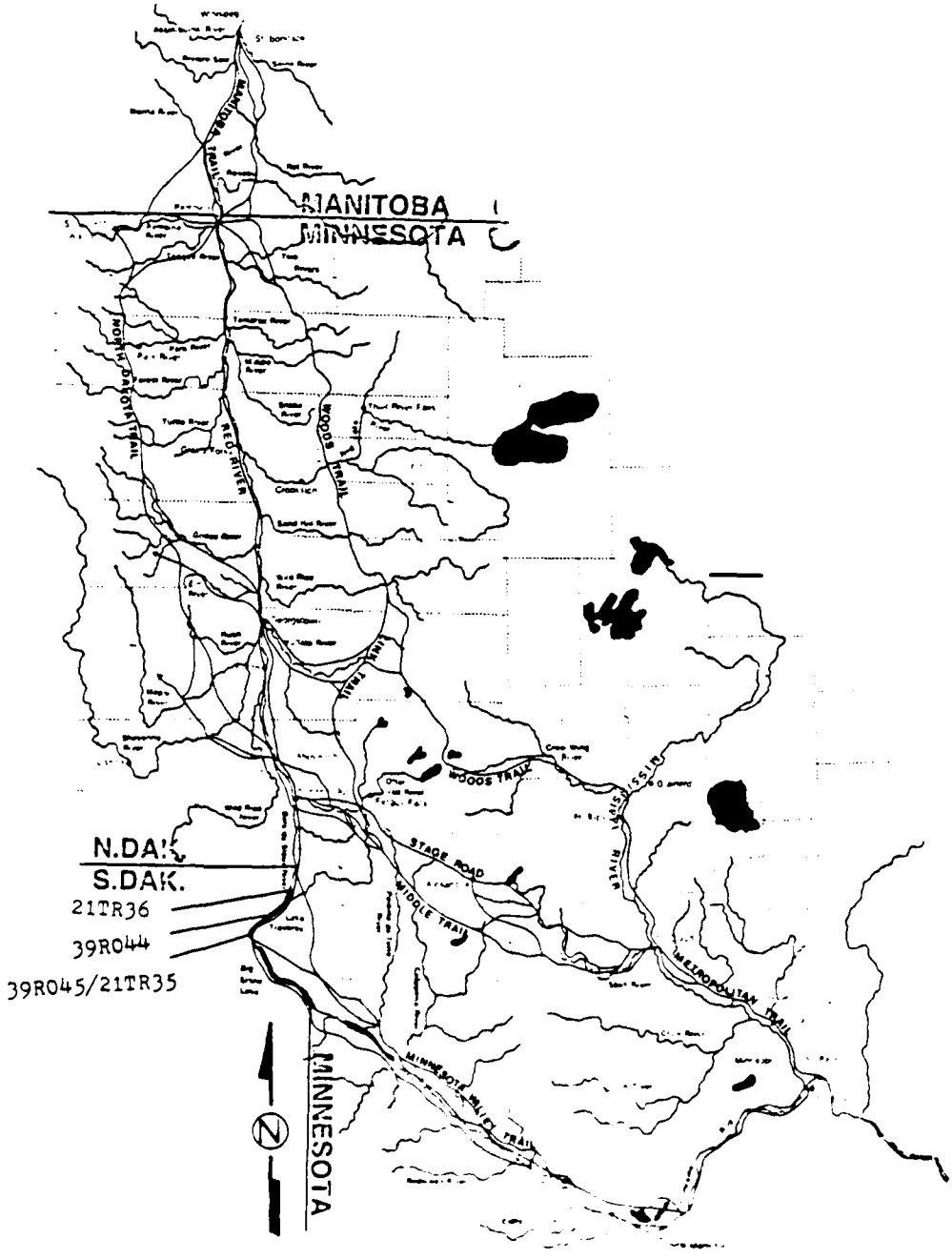


Figure 15. Map showing locations of the sites and Minnesota Valley Trail.(from Gilman et al. 1979).

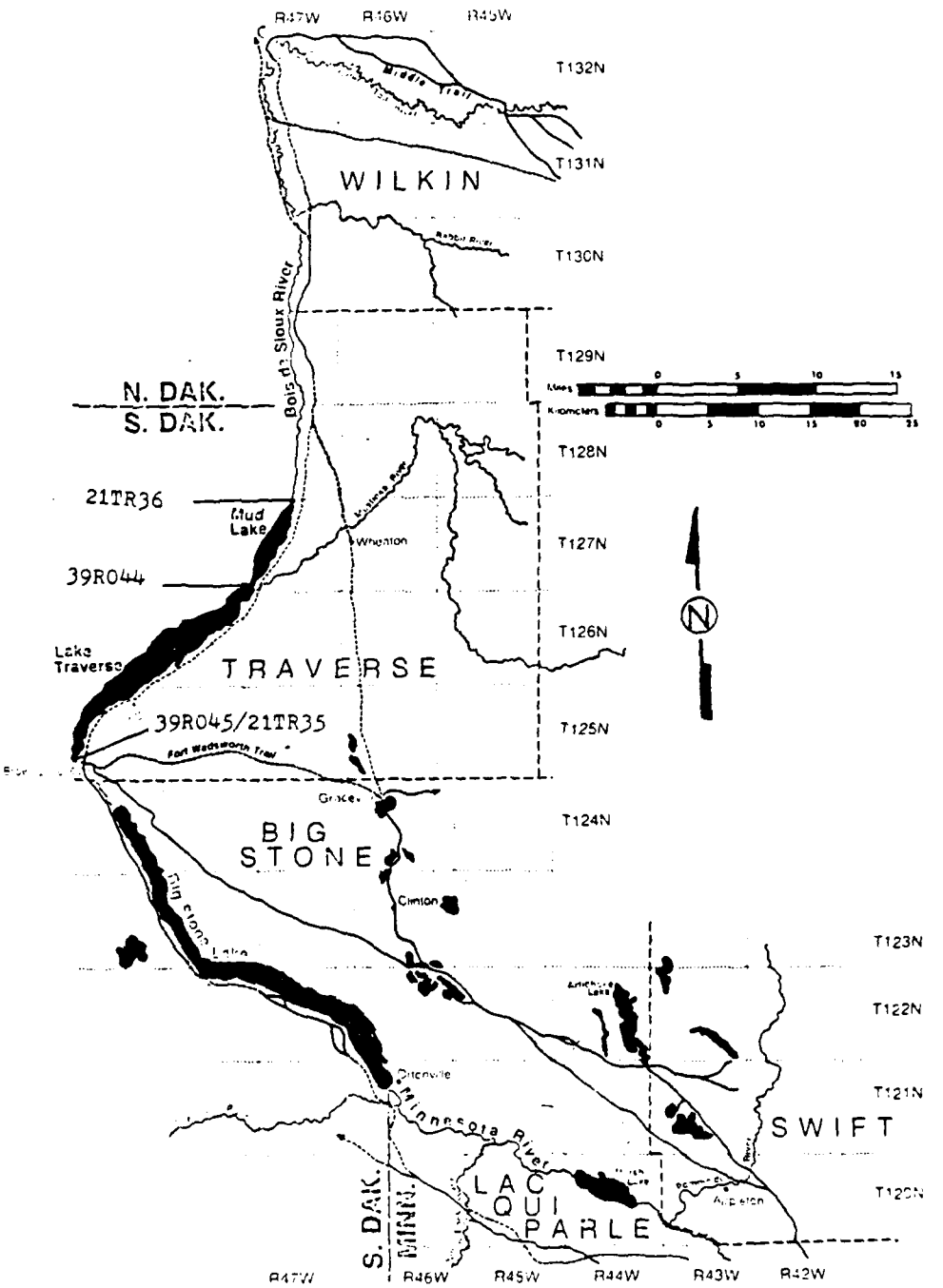


Figure 16. Map showing the locations of the sites and Fort Wadsworth Trail. (from Gilman et al. 1979).

34, T125N, R49W)(Muellenbach 1958:19). The stage line was discontinued when a railroad through Browns Valley was completed in 1880 (Neill 1882:987).

In 1880, two railroads were built in the Lake Traverse area. The St. Cloud and Lake Traverse Railway Company built a line from Morris Junction to Browns Valley. This railroad passed into the possession of the Great Northern Railway in 1907 (Kieserling 1970:116). The present Chicago, Milwaukee, St. Paul, and Pacific Railroad line was also built in 1880. Several villages in Traverse County were platted along its route. Wheaton, the county seat, was one of them (Muellenbach 1958:11). In 1913 another line, the Fairmont and Vublen Railroad, was built through Rosholt, South Dakota, located north of Lake Traverse. It was sold to the Soo Line in 1914 (Swanberg 1961:108).

Between 1905 and 1920, farmers were looking for an easier way to get their grain to market, and Lake Traverse became an important commercial artery. In 1906, the Lindquist brothers built an elevator at Diamond (Fig. 18). This was the first of five elevators on the lake. The elevator was completely destroyed in 1916 by an explosion caused by a leaky gas engine. During the rebuilding, it caught fire again. It was rebuilt and continued in operation until 1924 when business ebbed (Kieserling 1970:120-121).

Shortly after the Diamond elevator was originally built the Lindquists persuaded the Great Northern Railway to build an elevator at the south end of Lake Traverse and run a mile-long spur to it from Browns Valley. This elevator, built around 1908, was known as the Brown Valley Landing. In 1909, the Linquists built an elevator at Dakomin, across the lake from Diamond (Fig. 18)(Kieserling 1970:121-122).

The Lindquists operated two boats on Lake Traverse. The "Diamond", for which the elevator was named, only carried passengers. The "Traverse", a Mississippi River stern-wheeler tug boat powered by an enormous upright gasoline engine, carried passengers, hauled freight and pushed barges (Johnson 1982:35-37). In addition, the Lindquists constructed very large barges, such as the Diamond Line, with beveled bins in each barge that could hold a carload of grain (6500 bushels), depending on the depth of the lake (Anonymous 1966, Sec. 2:3). The push method of moving these barges by heavy ropes and capstans was used (Johnson 1982:35).

Since a lot of grain was moved at night during the summer months, four lighthouses were constructed along Lake Traverse by the government. They were simply kerosene lights with five gallon tanks set upon small steel towers on stone piles. In the winter, when the lake was frozen, large logging sleds were pulled down the lake by horses (Johnson 1982:35).

Crops were poor in 1910 and by 1912 the Lindquists were

in deep financial trouble. It was at this time that the Ely-Salyards Company of Duluth took over the business. In 1912, grain production was so high that an elevator was built at Jensen's Island (Fig. 17). In that year the Jensen elevator handled over one and one-half million bushels of grain, which was about half of what the whole Diamond Line handled. Jensen's elevator once handled more grain than any South Dakota elevator, an average of 450,000 bushels per season. The Jim Creek elevator was built in 1913 by Ely-Salyards (Kieserling 1970:122).

The wheat business the elevators handled reach quite gigantic proportions before they folded. Continuing poor crops, the expansion of the railroad (Kieserling 1970:121), and a government drainage proposition which lowered the lake so sharply that more than a carload of grain could not be handled without getting stuck, all contributed to the demise of this once thriving grain trade. The elevators were torn down in the mid 1920's and the materials were used on buildings elsewhere. Cement foundations remain at the elevator sites (Kieserling 1970:121-122).

Euro-American Settlement

The Minnesota Territory, of which Lake Traverse was a part, was organized in 1849. When Minnesota was admitted to the Union as a state in 1858, iron monuments were erected at the heads of lakes Traverse and Big Stone. The line between them was designated as the boundary between Minnesota and Dakota (Barrett 1881:14). In 1861, the Dakota Territory, which included the west shore of Lake Traverse, was organized. South Dakota was admitted as a state in 1889.

In 1870, there were only 13 Euro-Americans within Traverse County, Minnesota (Anonymous 1938:7). The government surveys of 1870 officially opened the region, including the east shore of Lake Traverse, to settlement commencing in 1871-1872 (Neill 1882:987). Much of Traverse County was settled between 1878 and 1888. On the west side of Lake Traverse, the Sisseton-Wahpeton Reservation was officially opened to homesteaders at noon on April 15, 1892. Lake Traverse was a great asset to the early settlers since game and fish were available in great abundance and easily obtained. This provided much food for families that had settled within a short distance of the lake (Swanberg 1961:70). (See Table 9 for the names and dates of arrival of early settlers in the area).

During the 1880's most of the immigrants came from Germany, Scandinavia, Great Britain, and Ireland, but by the later 1890's, most immigrants came from eastern, southern, and central Europe (Luebke 1977:407; Holmquist 1981:3). "The most important single cause that impelled people to leave Europe was economic" (Luebke 1977:408). Since landowners were highly respected in Europe, the prospect of owning land on

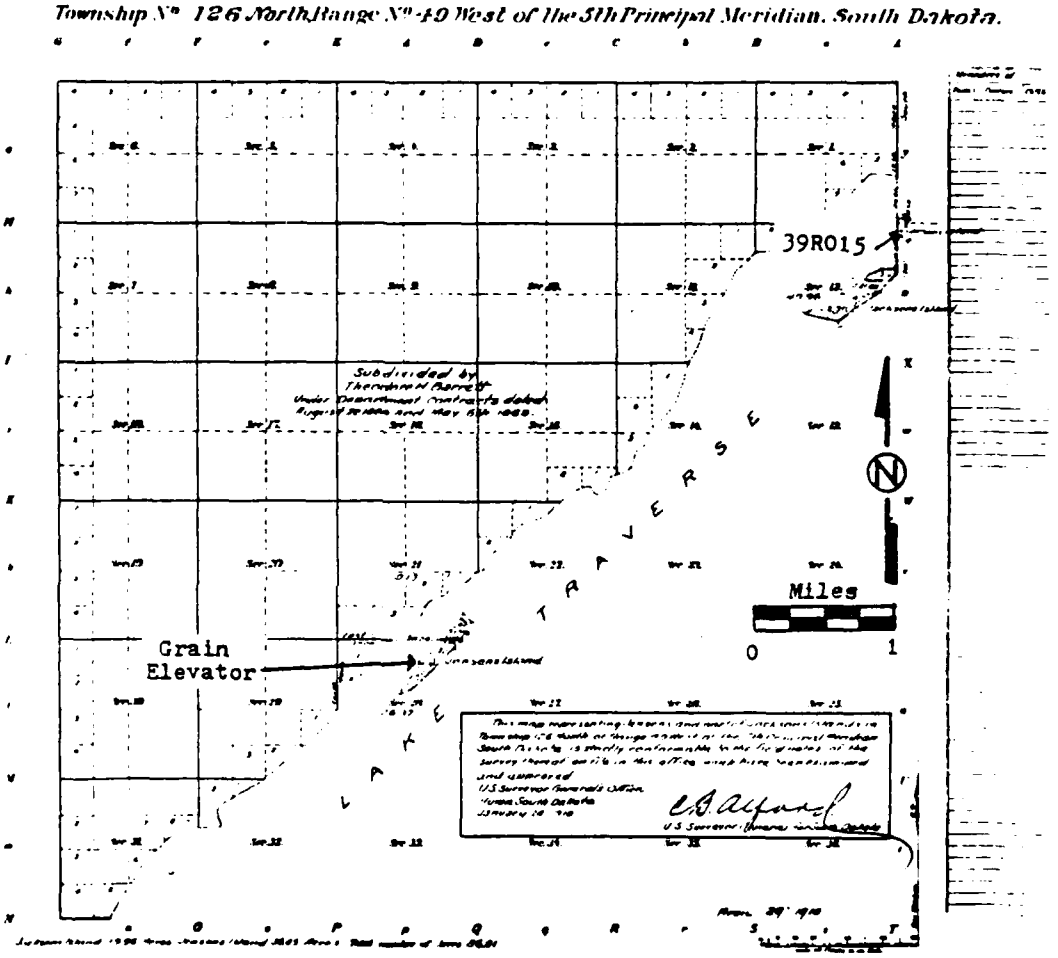


Figure 17. General Land Office map (GLO), ca. 1909, T126N, R49W, showing the location of grain elevators on Jensen's Island.

Table 9

Date of Arrival of Early Settlers in Browns Valley Area
(from Marie Kieserling 1970)

Name	Date of Arrival
Major Joseph R. Brown	1835
Tom Bailey Family	1867
George B. Scheifley	1871
Joe Bangle	1876
W. J. Smith	1877
Walter Steers	1877
Dr. E. R. Marshall	1877
Dan Tenney	1877
E. S. Beck	1877
Peter O'Neill	1878
Cornelius Geurts	1878
Herman Lubbers	1878
C. W. Becker	1878
Geo. M. McLane	1879
James Maroney	1879
Anton Burnell	1879
J. D. Brewster	1879
Marvin Dale	1879
A. Cowles	1880
W. J. Potts	1880
H. W. Barrett	1880
E. H. Bowman	1880
J. O. Barrett	1880
S. Y. Gordon	1880
A. W. Mitton	1880
Halvor Johnson	1880
James Layden	1880
Joe Eastmen	1880
J. T. Schain	1880
Chas. Meade	1880
Vitch Oliver	1880
Joe Foren	1880
Ben Reisdorf	1880
Jas. Crear	1880
Andrew Benson	1880
H. W. Dezotell	1880
S. W. Frasier	1880
A. S. Crossfield	1880
Burt Train	1881
Henry Roach	1881
Matt Dunser	1881
Wm. Webster	1882
John Kieserling	1882
Alexander Paul	1886
Dr. Theo. Harcum	1888
N. O. Nelson	1888
G. N. Bowyer	1888

the American Great Plains as a result of the Homestead Act of 1862 and the opening of reservation lands, was overpowering for many European peasants. In order to qualify for a free 65 hectare (160 acre) farm under the Homestead Act, a homesteader had to live on his claim for at least five years and cultivate it. In addition, he had to be a citizen or he had to have taken out his first papers for naturalization (Luebke 1977:409).

Most European immigrants arrived on the Great Plains as family units. Relatives and neighbors usually followed later. However, formal colonization was carried out by ethno-religious societies and the railroads which had ten mile wide strips of alternating sections of land for sale on both sides of their right-of-way. Sometimes, large colonies of immigrants came as the result of highly organized programs. Although less organized in their efforts, the various churches were also important in the settlement of the Great Plains. As a result of these colonization efforts, the various ethnic groups were able to retain their own religion, language, and culture (Luebke 1977:407, 410-411).

Most of the early homesteaders in the Lake Traverse area were Old-Stock Americans, Germans, and Swedes (Holmquist 1981). "The Old-Stock Americans were members of white European families whose ancestors had resided in North America for a number of generations before they made the trek to Minnesota" (Rice 1981:55). Rubinstein (1981:121-122) suggests that many of the homesteaders, no matter what their nationality or ethnic background may have been, were only concerned with gaining title to a farm of their own. The only prerequisites were that the farmland had to be rich and full rail service had to be available.

Briggs (1930:79-80) has suggested that the extension of railroads throughout most of the northern Plains was important in starting and maintaining the flow of settlers into the area. The land boom would not have been possible without good transportation facilities. The appearance of railroads resulted in lower transportation costs for necessities brought into the region and also made it profitable to send surplus crops to market. In addition, railroads made it possible to ship in building materials at a lower cost than was otherwise possible. The railroads also attracted settlers by distributing pamphlets and publishing advertisements that described the country and listed its advantages.

Historians disagree as to whether settlements drew railroads or vice versa. It is probable that neither view should be used as a hard and fast rule. Both situations probably occurred. In terms of the present project, the appearance of the railroad led to the decline in the importance of Browns Valley and the demise of several small towns on and near Lake Traverse.

Major Joseph R. Brown purchased a log house at Fort Wadsworth in 1866. After the logs were numbered, the house was dismantled and hauled by ox team to the present site of Browns Valley where it was rebuilt. The log house, serving over the years as a home, trading post, stage line station, tavern, inn, and newspaper, became the nucleus of a town. In 1867, a post office was established and Samuel J. Brown served as the first postmaster. At that time the post office was known as Lake Traverse, but when Joseph Brown died in 1870 the name was changed to Browns Valley in honor of Brown. The townsite, surveyed and platted in 1878, is situated about 1.6 kilometers (1 mile) southeast of Lake Traverse in section 33 of Folsom Township (Allanson 1958:6-7)(Fig. 18). A railroad spur reached the town in late 1880. Browns Valley became the first county seat of Traverse County in 1881 (Barrett 1881:18, 20). It lost the county seat to Wheaton (the present county seat) in 1889 when the railroad was built through Wheaton.

Diamond, named after a boat that operated on Lake Traverse, was located in the NE1/4, SE1/4 of section 32 in Harmon Township on the west side of the lake (Figs. 18 and 19). It was founded by the Lindquist brothers around the turn of the century when they built their first elevator there (Anonymous 1966, Sec. 2:3). In its prime, Diamond boasted two general stores, the elevator, the St. Hilaire Lumberyard, a blacksmith shop, a post office, a telephone exchange, and four or five houses. Water from an artesian well was piped throughout the little town. When the Soo Line was built 16 kilometers (10 miles) north of Diamond, most of the buildings were sold and moved, although several families lived at the former townsite during the Depression (Johnson 1982:34-38).

Dakomin was located in Windsor Township on lot 5, section 11, across the lake from Diamond (Fig. 18). (The name, Dakomin, was derived by uniting portions of "Dakota" and "Minnesota"). This small hamlet sprang up when the Lindquist brothers installed a line of boats on the lake and the Great Northern Railroad built a spur from Browns Valley to the head of Lake Traverse in 1908. The village consisted of an elevator, a general store, a post office, a blacksmith shop, and a few houses. The settlement died when the boat line was discontinued in 1917 and the railroad bypassed the area (Muellenbach 1958:15; Kieserling 1970:120-121).

Travare, located 1.6 kilometers (1 mile) west of Browns Valley on a triangular piece of land between the Sisseton-Wahpeton Reservation and the South Dakota-Minnesota state line, was situated on a hill overlooking lakes Traverse and Big Stone (Figs. 18 and 20). The town existed about 10 years, from 1883 to 1893, and served briefly as the county seat of Roberts County. There were seven buildings: the Dakota Sun (a newspaper), the Travare House (a hotel), the Munro and Cable Drug Store, the Fred Dittes, Jr. Grocery, the Bernie Marian

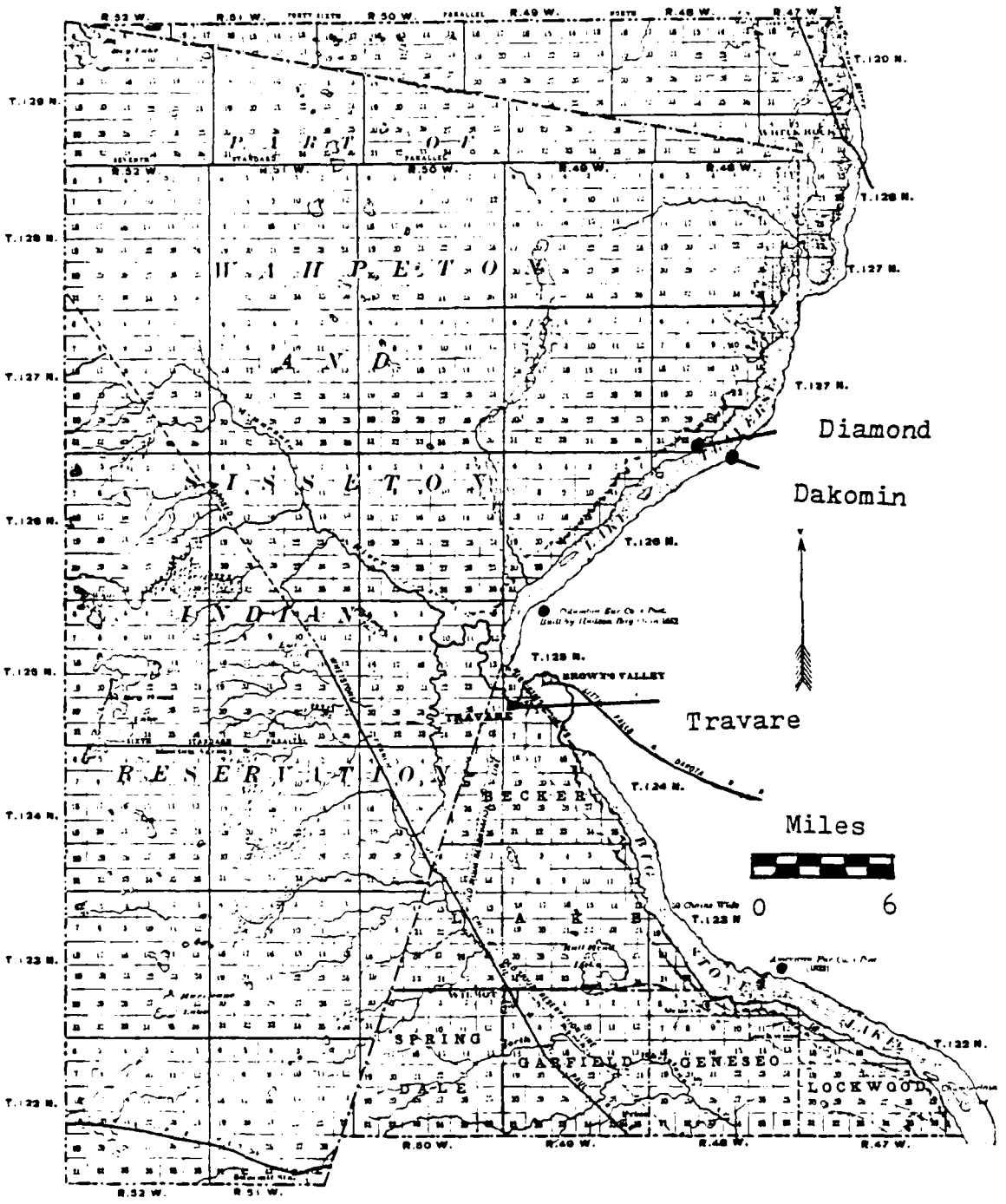


Figure 18. Early map of Roberts County showing the location of early fur trading posts and boundaries of the Wahpeton and Sisseton Reservation.

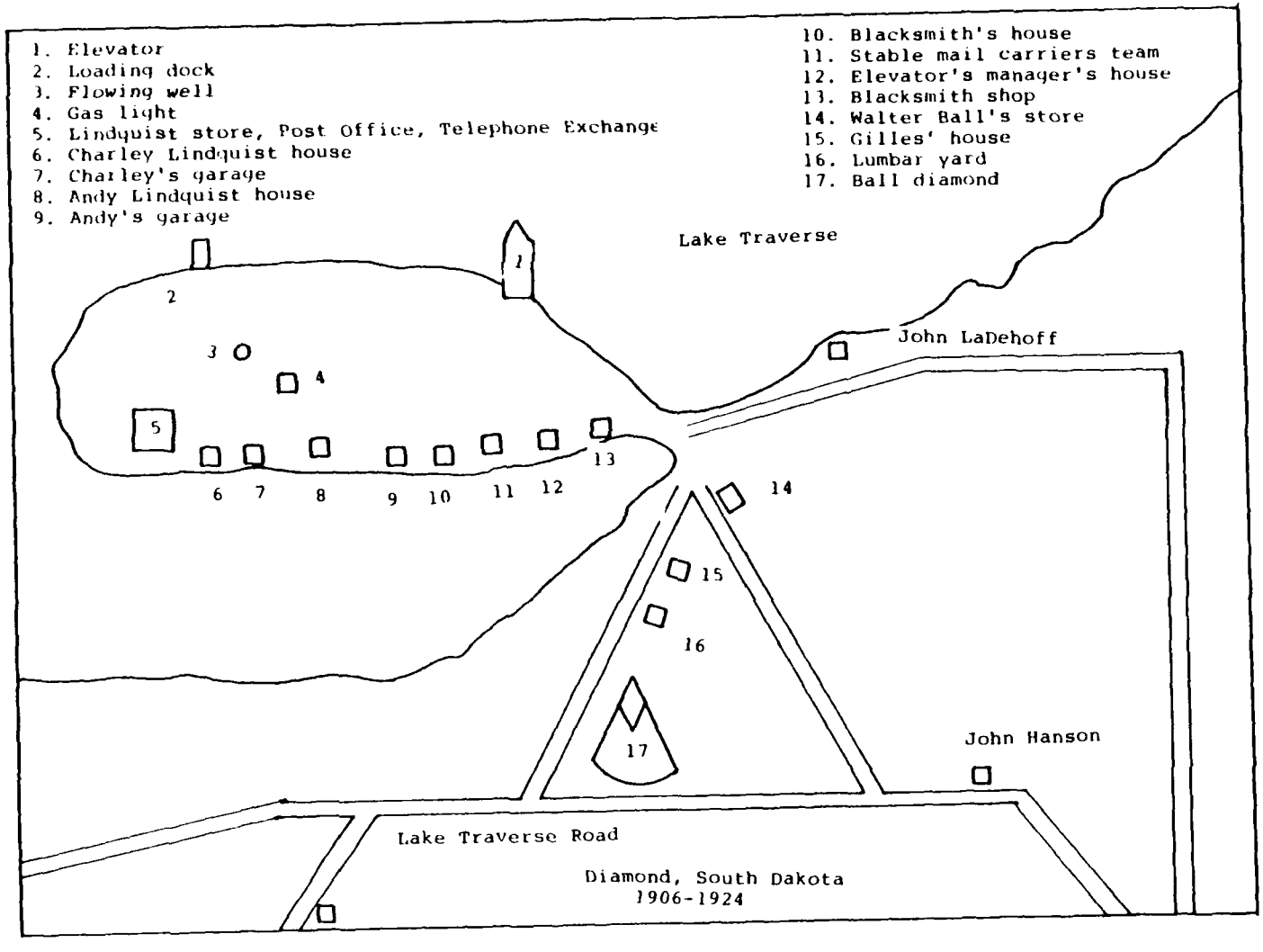


Figure 19. Plat map of the town of Diamond, South Dakota.

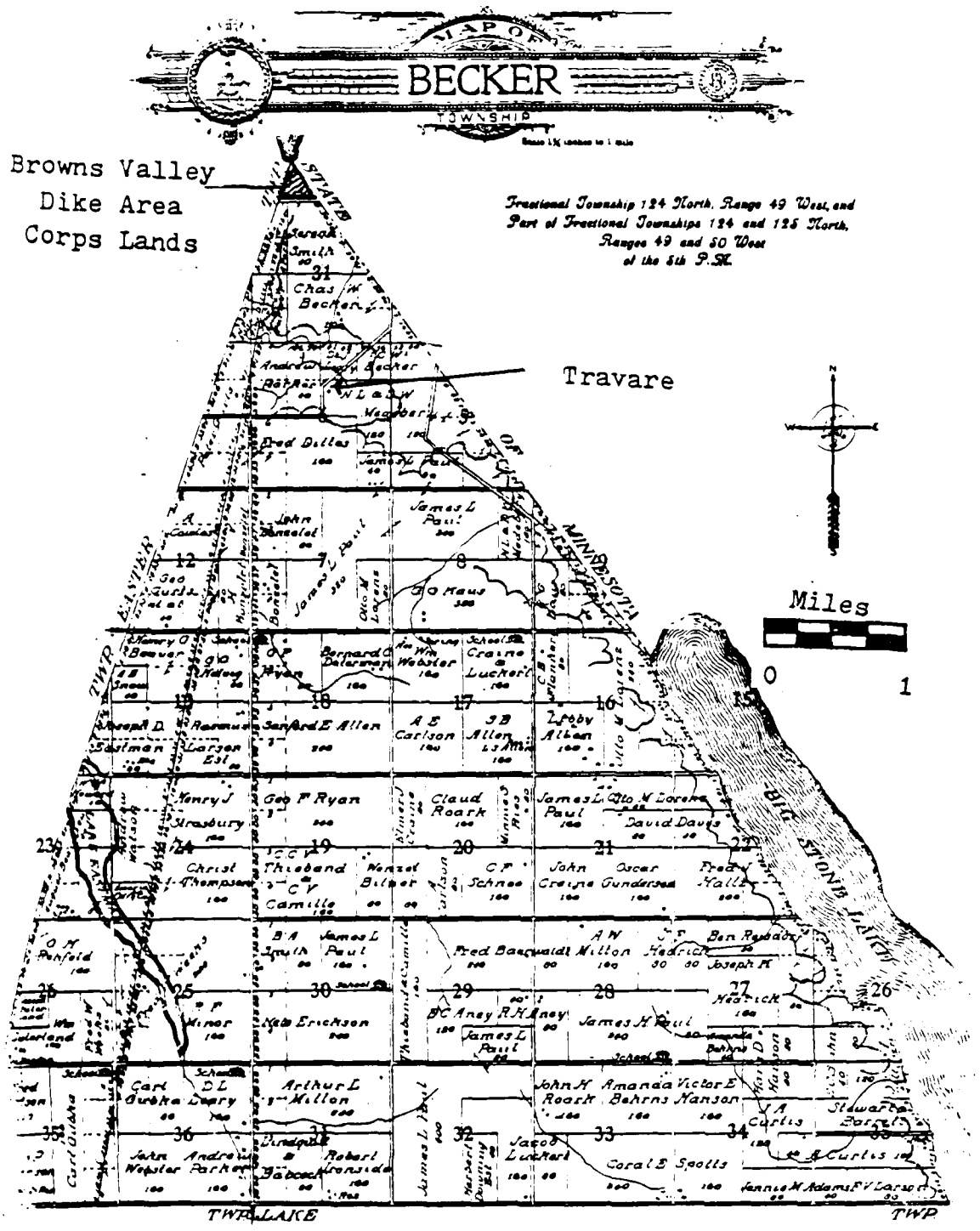


Figure 20. Roberts County atlas map of Becker Township, ca. 1910.

Grocery, the W. Philbert Law Office, and a post office (Anonymous 1966, Sec. 2:3). Travare, viewing itself as the gateway to the West, made Browns Valley uneasy since all along the Red River it was generally the towns on the west side of the river that fared best (e.g., Fargo, Grand Forks, Wahpeton, etc.).

For a time there was considerable rivalry as to which town would be the first to build a flour mill. When Travare selected a site in the ravine of the Little Minnesota River, Browns Valley folk kidded them by saying, "Travare has a dam by a mill site, but they don't have a mill by a damn site". Travare succeeded, however, in selling bonds and erecting a mill that was run by the Dittes brothers (Muellenbach 1958:14). The mill did a large business and had the highest quality flour. It supplied the Ryan Hotel in St. Paul (then the leading hotel in the Northwest) and even exported to Europe. The mill burned down in 1892. The loss of the mill and the loss of the county seat to Wilmot were blows that the young town could not withstand (Morris 1934:17-19).

Maudada, platted in 1881, was located in the SW1/4 of section 6 in Walls Township, 1.6 kilometers (1 mile) south of the Mustinka River on the east shore of Lake Traverse (Fig. 21). Its name was formed by combining the first names of Maud Earsley and Ada Washburn, daughters of its two promoters. Maudada was designated a county seat at the hotly contested Traverse County election in the fall of 1881, winning it by 16 votes. One term of court was held there and several sessions of the county commissioners, but the election was annulled by the courts and the county seat was returned to Browns Valley. The 12 legal voters of the village had cast no fewer than 30 ballots.

Enticed by Maudada's attractive location and the prospect of a railroad, a number of business ventures were started: two stores, a 45 barrel flour mill, a hotel, a blacksmith shop, a livery stable and a newspaper, as well as a number of residences. The town died when it was bypassed by the railroad. The buildings were torn down or moved. Nothing remains but the depressions left by collapsed cellars to mark the site of the town (Kieserling 1970:173-174).

None of the above towns are located on Lorps lands at the Lake Traverse - Bois de Sioux Project. They are mentioned because they each played an important part, even though for only a short period of time, in the Euro-American settlement of the Lake Traverse area.

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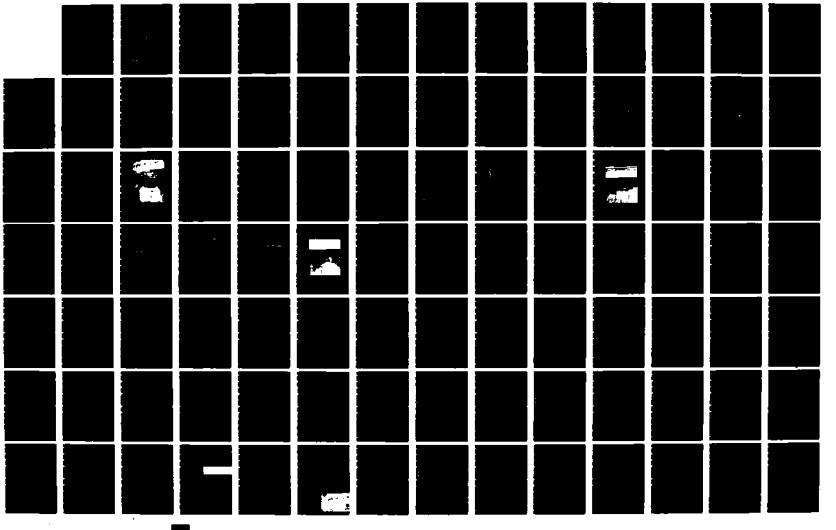

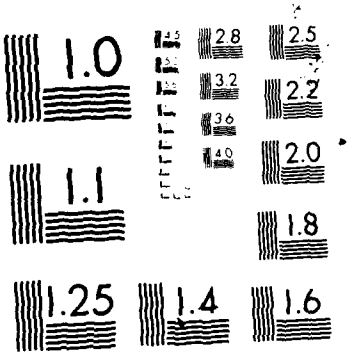

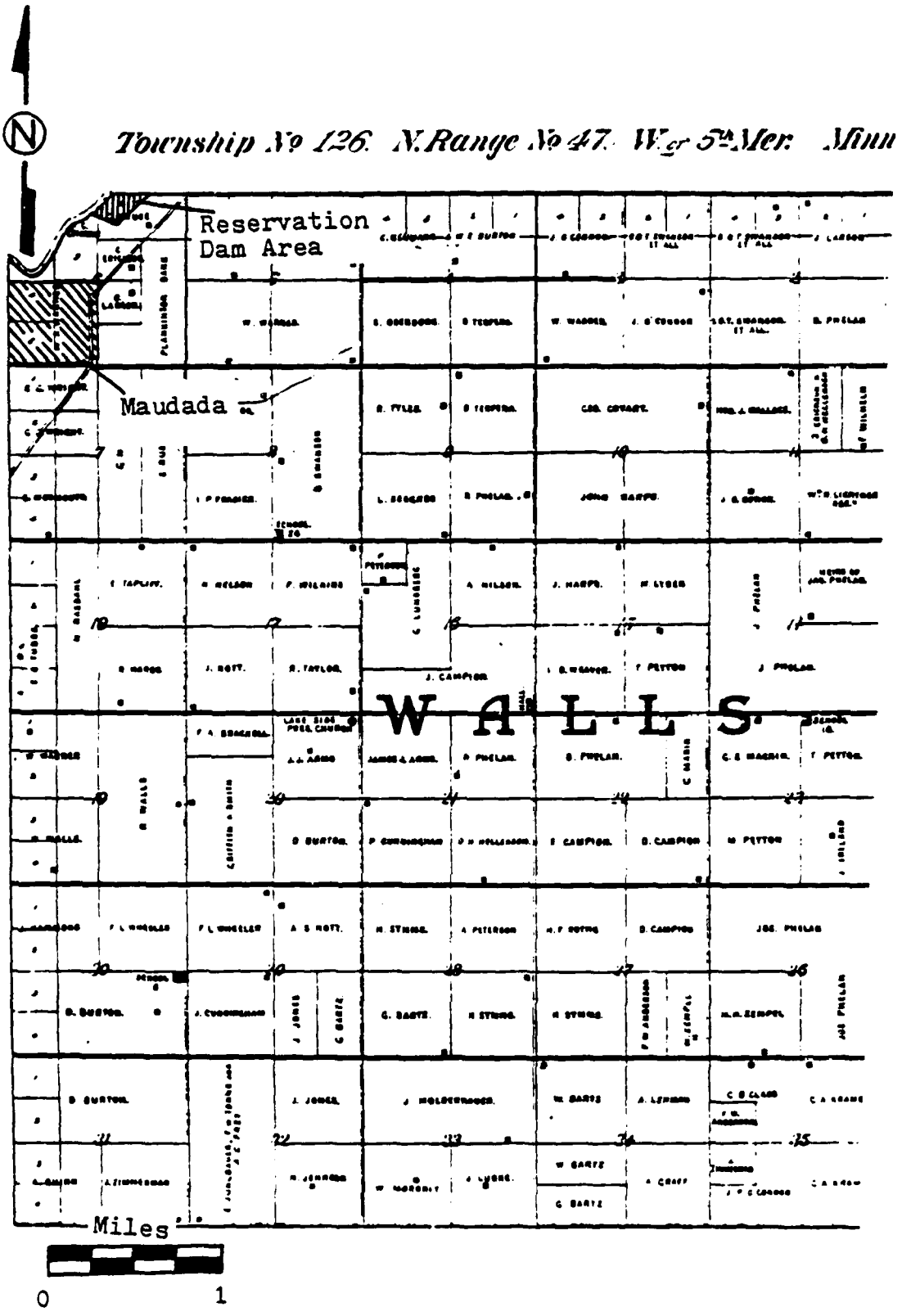

Figure 21. Walls Township map showing the location of Maudada townsite and the east edge of Reservation Dam.

CHAPTER 4

Field and Laboratory Methods

Introduction

Initial work began in October, 1982, with a search of pertinent archaeological site information. The site inventory files for the states of South Dakota (Vermillion) and Minnesota (Ft. Snelling) were examined. The archaeological pedestrian reconnaissance began the last week in October.

Literature and Records Search Methodology

The project historian conducted a literature search for published and unpublished reports and documents relative to the history of the Lake Traverse region. Research of historical documents for the project area included a search of unpublished manuscript materials. The following is a summary of materials examined at various institutions.

Historical Preservation Office Files

(1) Historic site files in the Minnesota State Historical Preservation Office, St. Paul were searched for Traverse County. Other historic and archaeological sites located near the project area in Traverse County were also noted.

(2) Historic site files in the South Dakota State Historical Preservation Office, Vermillion were searched for Roberts County. Other historic and prehistoric sites located near the project area in Roberts County were also noted.

County Registers of Deeds

Land ownership records were searched for project lands at the Roberts and Traverse county courthouses. Early county atlases were examined to help determine the previous owners of the properties within the project area.

Libraries

Libraries used in conducting the literature and records searches include: the South Dakota Historical Society (Pierre); the Minnesota Historical Society (St. Paul); the Minnesota Historical Society Research Center (St. Paul); the Minnesota Historical Society (Ft. Snelling); the I.D. Weeks Library on the campus of the University of South Dakota (Vermillion); and the Watson Library on the campus of the University of Kansas (Lawrence).

Other

Local newspapers, including the Sisseton Courier (Sisseton) and the Valley News (Browns Valley), were examined for pertinent historical information. U.S. General Land

Office survey maps were available at the Secretary of State's Office in St. Paul for Minnesota, and at the Office of School and Public Lands in Pierre for South Dakota. Local historians and residents contributed information on historic sites within the project area. Local informants include Marie and O'Donald Simonson, Henry Alsaker, and Fred Trende of Rosholt, South Dakota; Mrs. Harold Gibson of Beardsley, Minnesota and Virginia Bigelow of Browns Valley, Minnesota. The Land Index for the Sisseton-Wahpeton Reservation, Titles and Records Section, Aberdeen Office of the Bureau of Indian Affairs were checked for records pertaining to site 39RO44.

The Archaeological Reconnaissance Methodology

The Principal Investigator examined reports concerning previous archaeological investigations in and near the project area. An archaeological field crew was selected. Crew members were Kenneth Brown and Marie Brown. Dennis Beissel was the geomorphologist for the project. The archaeology field crew and geomorphologist drove to the project area during the last week of October, 1982.

Lands held in fee title by the U.S. Army Corps of Engineers in the Lake Traverse-Bois de Sioux project total 616 hectare (1,521.9 acres). The fee title lands have six broad types of vegetation: (1) 18 hectares (42 acres, 3 percent) are in agriculture; (2) 180 hectares (443 acres, 29 percent) are in grassland; (3) 173 hectares (425 acres, 28 percent) are in wetlands; (4) 40 hectares (98 acres, 6.5 percent) are in forest; (5) 201 hectares (496.4 acres, 33 percent) are under water; and (6) four hectares (7.5 acres, 0.5 percent) are in recreation and residential use (Fig. 22)(Scope of Work). The field survey methods differed for some of the different vegetation types depending upon ground surface visibility. The ground surface visibility scale used for Corps lands at Lake Traverse is shown in Table 10.

Agricultural Lands

The lands in agriculture (e.g., wildlife food plots, 18 hectares) were all examined for evidence of cultural remains (Table 11). Shovel tests were not dug on cultivated lands because of good to excellent ground surface visibility. Most of the cultivated lands were small, approximately one hectare (2 acres) wildlife food plots, but one area, located east of the White Rock Dam, covered an area of approximately 16 hectares (40 acres). One prehistoric site, 21TR36, was found located entirely within this large cultivated field. A portion of a histoic site, 39RO44, was found in several small wildlife food plots at the west end of Reservation Dam. However, most of the historic site is in grassland and forest. A third site, 39RO45/21TR35, was found by examination of a large cultivated field adjacent to Corps lands. The Corps lands were densely covered by grass and forest vegetation. The site, which has a prehistoric occupation, is located south of the Browns Valley Dike. No artifacts were

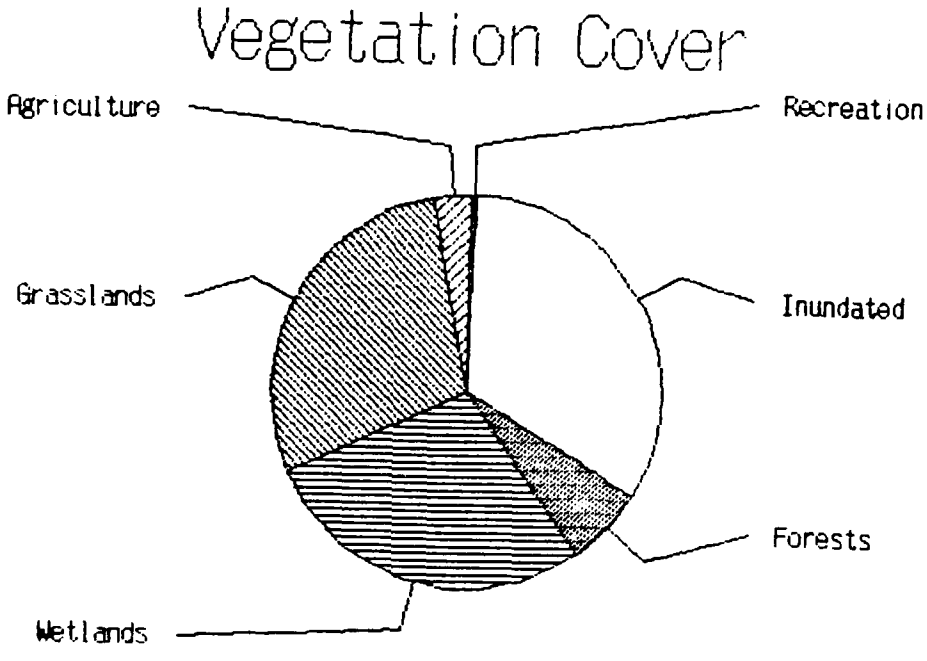

Figure 22. Pie graph showing the relative proportions of the Corps lands with respect to vegetation cover.

Table 10

Ground Surface Visibility Scale

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1. Excellent: 80 to 100 percent of ground surface (soil) is clear of vegetation cover, e.g., a plowed field or beach.

2. Good: 50 to 80 percent of ground surface (soil) is clear of vegetation cover, e.g., cultivated field in crops or forested areas with little or no grass cover.

3. Fair: 25 to 50 percent of ground surface (soil) is clear of vegetation cover, e.g., forested areas with some grass cover and sparsely covered grasslands.

4. Poor: 0 to 25 percent ground surface (soil) is clear of vegetation cover, e.g., uncultivated grasslands or a talus slope covered with brush and trees.

observed on the surface of the portion of the site which extends onto Corps lands.

Grasslands

Approximately 78 percent of the grasslands were examined (140 hectares) for evidence of cultural remains (Table 11). Approximately 40 hectares (98 acres) were not examined because they consisted of the steep slopes of White Rock Dam, Reservation Dam and the Browns Valley Dike. These three earthen structures are all in grasslands. They are constructed of soils that have been greatly disturbed and hauled to their present locations (Figs. 3-8). The White Rock Dam covers approximately 28.5 hectare (70 acres), the portion of the Reservation Dam within Corps lands covers approximately seven and one-half hectares (18 acres) and the Browns Valley Dike covers approximately four hectares (10 acres).

Ground surface visibility in the grasslands was generally poor. The surveying technique employed consisted of spacing the crew members 15 to 20 meters apart and traversing the grasslands along transects. Shovel tests were dug at 15 to 20 meter intervals. Shovel tests consisted of digging circular holes to a depth of approximately 30 cm. Soils were sifted through quarter-inch hardware cloth. Initially, shovel test forms were filled out. However, after digging 44 shovel tests, the redundancy in the negative results of the shovel tests in addition to the homogeneous nature of the soils (lack of stratigraphy) did not seem to warrant the time consuming effort of filling out a level form for each shovel test. Therefore, shovel test level forms were filled out for only the first 44 shovel tests, located in the vicinity of the Browns Valley Dike (Fig. 8)(Appendix C). Level forms were filled out for subsequent shovel tests only if the pits yielded cultural remains and/or discernible stratigraphy. Besides shovel tests, the back-dirt of rodent burrows and cattle paths were carefully examined for evidence of cultural remains. A portion of site 39RO44 was observed in grassland vegetation at the west end of the Reservation Dam.

Wetlands

None of the wetlands (173 hectares) were examined for cultural remains (Table 11). The wetlands consist of marsh vegetation, with standing water and soggy ground. The standing water and marsh vegetation prohibited examination of the ground surface and soggy ground was not conducive to pedestrian examination and shovel tests.

Forests

Approximately 50 percent (20 hectares) of the forested lands were examined for cultural remains (Table 11). The remaining forested lands were not examined because of the

Table 11

Corps Land Status, Vegetation Cover, Areas Surveyed

Corps Land Status	Hectare Area	% of Total	Ground Visibility	Hectare Area	% Surveyed
1. Agriculture	18	3	Excellent	18	100
2. Grasslands	180	29	Poor	140	78
3. Wetlands	173	28	Poor	0	0
4. Forests	40	6.5	Fair	20	50
5. Inundated	201	33	Poor	0	0
6. Recreation and Residential	4	0.5	Fair	2	50
	----	----		----	
Totals	616	100		180	
Acres	1521.9			444	

presence of shallow water and soggy ground, which were not conducive to pedestrian examination. The ground visibility in the forested lands was generally fair, with much of the forested areas being along steep river or lake shoreline banks. These steep banks were oftentimes eroded, exposing surface and subsurface soils. Where erosion was present, the banks were cut-back with a shovel to expose possible buried remains. Where vegetation cover, usually consisting of grass, was greater than 25 percent, shovel tests were dug. Shovel tests consisted of circular pits dug to a depth of approximately 30 cm. Soils were sifted through quarter-inch hardware cloth. A portion of site 39RO44 was observed in a partially forested area at the west end of the Reservation Dam.

Inundated Lands

None of the inundated lands (201 hectares) were examined for cultural remains (Table 11). The water prohibited examination of the ground surface and was not conducive to pedestrian examination.

Recreational and Residential Lands

Approximately 50 percent (two hectares) of the recreational and residential lands were examined for cultural remains (Table 11). The other portions of these lands did not permit or were not conducive to pedestrian examination and shovel testing because they consist of roadways (concrete and gravel), buildings (house, garage, restrooms) and landscaped terrain (yards surrounding house, garages, and restrooms). The areas examined within recreational and residential lands had grass as the predominant vegetation. Shovel tests were not dug on any of these lands because, except for the residence on the bluff top east of White Rock Dam, the lands consisted of the fill used in construction of the dams themselves. The roadside park near the western end of the Reservation Dam is built on fill earth used to construct the dam and is not part of the natural terrain. All soils at this park are disturbed, having been hauled to this location from an undetermined source. Likewise, the park near the east end of White Rock Dam is built upon fill earth, which is part of the dam. These soils are also all disturbed, having been hauled to this location from an undetermined source.

In summary (Table 11), approximately 18 hectares were examined that were under cultivation, 140 hectares were examined in the grasslands, 20 hectares were examined in the forests, and two hectares were examined in recreation and residential areas. None of the wetlands and inundated lands were examined. A total of approximately 180 hectares (444 acres, 29 percent) of the total 616 hectares (1,521.9 acres) of land held in fee title by the Corps of Engineers were examined for cultural remains. Field techniques varied for each type of vegetation. Shovel testing was conducted in

grasslands and forested lands, but no shovel testing was undertaken in agricultural lands and recreational and residential areas. Three archaeological sites were found. One site was recorded near each of the three water control structures (i.e. White Rock Dam, 21TR36; Reservation Dam, 39RO44; Browns Valley Dike, 39RO45/21TR35).

It is interesting to note that a recent study of the effectiveness of four commonly used sampling techniques (shovel testing, one meter square excavation pits, coring, and clamshell digger) indicates the coring technique used in conjunction with microdebitage recovery methods was by far the most effective method for locating both surface and buried archaeological sites. The usefulness of this technique is enhanced in environments that have had little or no aeolian disturbance. Hand augering to collect cores, in conjunction with microdebitage recovery techniques, works best only where a stable environment of aggradation and post-aggradation can be assumed. Poorly drained wetlands are best (Nickolson 1983).

Microdebitage recovery methods include the saving of soil samples from the field cores and returning them to the laboratory for processing. The soils are water screened through 2 mm, 1 mm and 0.05 mm geologic sieves to recover microdebitage. A recent study shows lithic manufacture produces large amounts of microdebitage as a by-product and this material can be expected to permeate the soil matrix of a site occupation (Fladmark 1982).

Of the four commonly used sampling techniques it was found that shovel testing conducted on a known archaeological site did not yield any evidence of human occupation (Nicholson 1983:277). It should be noted that soils from the shovel tests were not sifted through quarter-inch hardware cloth. However, even the excavation of 1 x 1 meter pits, where soils were sifted through quarter-inch hardware cloth, was not a very effective technique for finding sites where cultural remains were thinly dispersed (Nicholson 1983:278). In the present Lake Traverse-Bois de Sioux project, none of the shovel tests yielded evidence of cultural remains, even though soils were sifted through quarter-inch hardware cloth. This compares favorably with the findings of the Nicholson (1983) study, since shovel tests on the known site south of the Browns Valley Dike (39RO45/21TR35) did not yield any evidence of cultural remains while the excavation of a 1 x 1 meter pit dug to a depth of 37 cm did yield minimal cultural remains (one flake and small flecks of charcoal). The effectiveness of sampling techniques is directly related to the density of cultural remains.

A 1 x 1 meter test pit was dug at each site recorded during the survey. This was done in order to determine the nature, depth, and potential significance of the sites. The units were excavated in arbitrary 10 cm levels. All soil was

sifted through quarter-inch hardware cloth.

Procedures followed during the field reconnaissance included plotting all site locations on 7.5 minute U.S.G.S. quadrangle maps. All sites were recorded on the appropriate South Dakota and/or Minnesota site inventory forms and were photographed.

Laboratory Methods

Artifacts were transported to The University of South Dakota Archaeology Laboratory in Vermillion, South Dakota. Laboratory work was begun during the first week in January, 1983, and completed during the last week of January, 1983. Artifacts were washed and catalogued. Site numbers were printed on all artifacts. Analysis included detailed examination of all artifacts to determine probable function, temporal placement, and cultural affiliation. Faunal remains were identified to the lowest possible taxon.

Prehistoric Chipped Stone Artifacts

The first human inhabitants of Minnesota and South Dakota had a well developed technology to modify stone into usable implements for all aspects of subsistence and survival. Reducing an initial mass of rock (lithic) material to the finished product requires many stages of manufacture, each of which produces waste. Knowledge of the techniques utilized by different cultures in making stone implements is of great importance in the study of past cultures. Certain cultures used specialized techniques in manufacturing some of their stone implements which is helpful in determining the cultural association and temporal placement of the artifacts. Modification of stones by the application of force, known as flint-knapping, is one of the earliest industrial arts of humans.

Differences observed between stone implement modification, or chipping, are sometimes related to the type of raw material utilized. The shape and use of the artifact is determined by the quality of the raw material and the skill of the individual flintknapper. Flint, chert, chalcedony, volcanic glass (obsidian), quartzites, and silicified sediments were widely used by the indigenous peoples of Minnesota and South Dakota for making stone implements. All have the necessary homogeneity, cryptocrystalline, macrocrystalline and highly siliceous properties that allow for controlled flintknapping. The raw material must be free of flaws, such as cracks and inclusions, or it will break unpredictably. One test of homogeneity is to strike the piece of raw material with a hammerstone, if it produces a ringing sound, it denotes homogeneity, if it emits a dull thud, it is not homogeneous.

Many lithic raw materials can be improved for modification by thermal alteration or heat treating (Crabtree and

Butler 1964; Hester 1972, 1973; Hester and Collins 1974; Purdy and Brooks 1971; Purdy 1974; Shippee 1963). Heat treating is performed by burying the raw material in sand or soil and slowly heating it to temperatures between 204 and 371 degrees Celsius (400 and 700 degrees Fahrenheit). The material is then slowly cooled. Heat treating relieves stresses in the stone and allows more control in flaking. Heat treating often causes color changes in the raw material; for instance, yellow sometimes changes to red. Heating a rock with a high moisture content too rapidly can cause fractures and the removal of small, round flake-like "pot lids".

Lithic Resource Utilization

Five types of lithic resources were identified within the collection of flakes and shatter recovered from the project area. The following is a brief description of the lithic types utilized by the prehistoric inhabitants of the region.

Tongue River Silicified Sediment

Tongue River silicified sediment occurs as a primary source in northwest South Dakota. Gravel deposits along the Grand River also contain this material and, since the Grand River flowed east to the James River prior to the last glaciation, the material occurs further east in glacial deposits and stream gravels. It occurs in stream gravel along the Little Sioux River in northwest Iowa (Porter 1962; Anderson 1978; Ahler 1977).

Tongue River silicified sediment varies in grain size from extremely fine to medium or coarse sand. Color varies from a light olive brown (2.5Y 5/4) to light yellowish brown (2.5Y 6/4) to weak red (10R 4/4) and dark reddish brown (2.5YR 3/4). Results from experiments in heat treating indicate the material turns a reddish color. Large pieces of Tongue River silicified sediment contain root and stem holes of all sizes. The material is extremely tough and resists weathering (Porter 1962; Anderson 1978; Ahler 1977).

Knife River Flint

Knife River Flint is a distinctive dark brown rock. The geologic source of this flint has been questioned in recent years. Knife River Flint was quarried from sources in the Knife River Valley in Dunn and Mercer counties, North Dakota. The material contains some irregular light and dark beds and lenses. It sometimes is mottled. It occurs as large boulders, small cobbles, and tabular chunks. Color varies from very dark brown (10YR 2/2) to thin, translucent flakes of lighter brown (10YR 3/3, 10YR 5/3). Weathering results in a light gray or white (10YR 7/2) patina (Clayton, Bickley, and Stone 1970; Ahler 1977).

Quartzite

Quartzites recovered from the area are characterized by great heterogeneity in grain size and color. Color is usually light gray, blue-gray, or pink. The stone occurs in the glaciated regions of South Dakota and Minnesota.

Chert

Cherts recovered from the region are medium grained to microcrystalline in texture. Color varies from bright red to white and yellow. Colors are oftentimes banded. Chert boulders and cobbles occur within the glaciated regions of South Dakota and Minnesota.

Quartz

Quartz occurs in the glaciated regions of South Dakota and Minnesota. It is usually white to opaque in color.

Artifact Typology

Introduction

The following typology contains information pertinent to cultural and historical significance. Artifact types are defined relative to their known cultural and historical associations.

FLAKES

Definition: Any piece of chert, flint or raw material that has been removed from a larger mass by the application of force and that has at least one of several distinguishing characteristics present: (1) a striking platform remnant; (2) compression rings; (3) a bulb of force; and (4) a hinge fracture. Flakes that are less than 3 cm in length along the axis of force are sometimes referred to as chips. Chips are often removed by a pressure flaking technique.
Potential errors: Flakes are usually easily recognized.
Cultural-historical position: Flakes are associated with all prehistoric complexes in South Dakota and Minnesota.
Research value: The presence of a large number of flakes at a site would indicate the location of extensive stone tool manufacturing.

CHUNKS/SHATTER

Definition: Any piece of chert, flint or raw material that is cubical or irregularly shaped and lacks any well-defined pattern of negative or positive bulbs of force, striking platforms, or systematic alignment of cleavage scars on the various faces (Binford and Quimby 1963).
Potential errors: Chunks/shatter may be confused with cores.
Cultural-historical position: Chunks/shatter are associated with all prehistoric complexes in South Dakota and Minnesota.
Research value: The presence of a large number of chunks/shatter would indicate the testing of raw materials that may be

associated with extensive stone tool manufacturing.

The implements described above can be further modified. Since flintknapping modified the blank from which the tool originated, it is often difficult or impossible to determine the type of blank from which a tool was manufactured. This is especially true of implements modified (retouched) on both faces, such as preforms, projectile points, knives, and drills. The following implement types may be marginally retouched or invasively retouched. Invasive retouch is the by-product of flake removal originating from the lateral edges of a blank and extending more than halfway across the dorsal and/or ventral faces of the blank. When modification occurs on both faces of a blank, it is referred to as a biface or bifacial retouch. Marginal modification is the by-product of flake removal originating from the lateral edges of a blank and extending less than halfway across the dorsal and/or ventral faces of the blank.

RETOUCHED FLAKES
Definition: A flake that has either a combination of marginal and/or invasive modification along one or more of its lateral edges or ends.
Potential errors: Retouched flakes may be confused with flakes that have been damaged by recent activities at the site, such as modern agricultural practices.
Cultural-historical position: Retouched flakes are associated with all prehistoric cultural complexes in South Dakota and Minnesota.
Research value: The presence of a large number of retouched flakes may indicate the maximum use of available raw materials.

BIFACE
Definition: A flake, chunk/shatter, or other piece of stone that has marginal and/or invasive modification on both faces to produce a symmetrically-shaped artifact. Well-defined working edges or areas of utilization may or may not be present.
Potential errors: Bifaces may be confused with knives and projectile points.
Cultural-historical position: Bifaces are associated with all prehistoric cultural complexes in South Dakota and Minnesota.
Research value: Bifaces may represent a variety of cutting and scraping tasks.

KNIFE
Definition: A biface that has marginal and/or invasive retouch on both faces. There is a well-defined working edge and/or areas of utilization. Knives occur in a variety of geometric forms, the most common being rectangular and sub-triangular. They are usually biconvex in cross-section with two lateral cutting edges. Broken projectile points were often recycled and used as knives.
Potential errors: Triangular, notched knives are often

confused with projectile points. One method to distinguish between hafted knives and projectile points is to determine the sharpness of the tip and the edge characteristics of the blade. Projectile points, in order to be successfully employed in procurement activities, must have a sharp point or tip. Knives generally have blunted tips. Projectile points are most commonly biconvex in cross-section while knives are more varied with alternating resharpening along the lateral edges forming a trapezoidal cross-section.
Cultural-historical position: Knives are associated with all prehistoric cultural complexes in South Dakota and Minnesota. Particular knife forms have specific names and some have a restricted temporal occurrence.
Research value: Knives are indicative of cutting tasks.

END SCRAPER
Definition: A flake that has been marginally or invasively retouched on one face to produce a regularly shaped straight-to-convex working edge on one end that is usually transverse to the axis of force.
Potential errors: End scrapers may be confused with retouched flakes.
Cultural-historical position: End scrapers are associated with all prehistoric cultural complexes in South Dakota. Large, plano-convex scrapers with invasive retouch on one face are usually associated with earlier cultural complexes, before 1,000 B.C., while smaller, marginally retouched scrapers tend to be associated with later cultural complexes dating after 1,000 B.C.
Research value: End scrapers are probably specialized maintenance tools used in hide preparation and working of wood and bone.

PROJECTILE POINT
Definition: A flake or unidentifiable modified blank that has marginal and/or invasive modification on one or both faces. The form is triangular to lanceolate in shape with a well-defined working edge, sharp tip or point, and a hafting element. Retouch is produced by percussion and pressure flaking techniques. The hafting element may consist of side notches, corner notches, stems and/or basal notches, flutes, and unnotched, ground bases. Projectile points are usually biconvex in cross section and have a wide variation in morphology and size.
Potential errors: Projectile points may be confused with knives.
Cultural-historical position: Projectile points are believed to be associated with all prehistoric cultural complexes in South Dakota and Minnesota.
Research value: The varieties of projectile points are good temporal and cultural indicators of a site's occupation.

HAMMERSTONE
Definition: Any fist-size, or smaller, cobble that has discernible battering on one or more edges. These were used

in manufacturing other stone tools and performing general maintenance tasks. Shapes vary considerably, with most being oblong to spherical.
Potential errors: These may be mistaken for river cobbles or glacial till.
Cultural-historical position: Hammerstones were used in all prehistoric cultural complexes in South Dakota and Minnesota.
Research value: Hammerstones at a site suggest the manufacturing of other stone and bone tools. They may also have been used in the butchering of animals, smashing bone for the extraction of marrow.

GROOVED MAUL
Definition: Any ground and pecked tool with wide blunt ends and a groove near either the center or one end to facilitate hafting. Mauls are usually oblong to spheroid in form, and may be fully grooved or three-quarter grooved. Battering is usually present on both ends. The most common raw materials are granite, quartzite and diorite.
Potential errors: Mauls are usually readily recognizable.
Cultural-historical position: It is believed that the earliest occurrence of grooved mauls on the eastern Plains is approximately 3,000 B.C.
Research value: Mauls indicate heavy pounding and hammering activities.

Prehistoric Pottery

POTTERY
Definition: Any piece of prehistoric clay material that was formed into the shape of a pot or vessel and that was subjected to high temperatures to "fire" the clay into an aplastic form. Pots were used to cook and store food and other materials.
Potential errors: Pottery is easily recognized.
Cultural-historical position: Pottery is most frequently associated with Woodland and later cultural complexes (A.D. 1 to 1850). The decoration and vessel forms are good temporal and cultural indicators.
Research value: The presence of pottery indicates a relatively late occupation of a site and the presence of food storage and preparation. The pottery recovered during the present project is assigned to Sandy Lake ware. Sandy Lake ware consists of both a smoothed and corded ceramic series. Ceramic sherds recovered from site 39RO45/21TR35 have exterior cord-marking. Sandy Lake ware is characterized by shell and grit tempered vessels. Shell tempered vessels occur more frequently in the southern range of the Sandy Lake ware distribution, suggesting a greater Mississippian influence. Vessel forms are globular, with rims generally straight, incurved or outflaring. Sandy Lake ware has been dated from ca. A.D. 1,000 to 1750 (Anfinson 1979:175-176). Concerning historic Indian pottery, the manufacture of pottery vessels was greatly diminished and eliminated during early access to Euro-American trade goods. Because metal pots were so much more durable,

they were an item oftentimes first acquired by indigenous peoples prior to actual Euro-American contact. Therefore, in the northern Plains the manufacture of indigenous pottery wares was supplanted by metal pots when the Indians of the region became involved in the fur trade.

Faunal Remains

FAUNAL REMAINS (vertebrates)
Definition: The skeletal remains of any vertebrate animal (i.e., mammal, bird, fish, reptile, amphibian).
Potential errors: Faunal remains are easily recognized. Specific identification of animal remains may be difficult.
Cultural-historical position: Animal bones can occur in any prehistoric or historic site in South Dakota or Minnesota.
Research value: Faunal remains can be good, past-climatic indicators, as well as helpful in determining subsistence and butchering patterns. In the present study a wide variety of vertebrate faunal remains were recovered and identified. Most of the faunal species identified can be attributed to historic occupation of the region, i.e., *Bos* and chicken. Rodent remains may be attributed to natural occurrences while fish, *Bison bison*, and *Canis* sp. remains may be attributed to either the prehistoric or historic use of the region.

Historic Artifacts

PORCELAIN
Definition: An artificial mixture containing kaolin, ground flint, and feldspar that is baked at an extremely high temperature. The addition of powdered glass or bone ash allows a lower temperature for vitrification. It is a steel-hard, vitreous, non-porous, translucent ware.
Potential errors: It is usually easily recognized.
Cultural-historical position: Porcelain, although first produced in 8th century China, was not manufactured in any great quantity in the United States until after 1900. It was not made in Europe until the 18th century.
Research value: Since porcelain was never easy to make and has always been expensive, its presence in a site may indicate the high status and/or wealth of the occupants.

WHITEWARE
Definition: A series of refined earthenwares manufactured from a white-burning clay fired at a high temperature to produce an opaque body with a clear, colorless glaze. It includes white earthenware and ironstone. They range from non-vitreous to vitrified, from more-or-less porous to non-porous. White earthenware occurs in a variety of vessel forms and is decorated using a wide range of methods and motifs (e.g., transfer-print, decal, molded, hand-painted, etc.). Ironstone tends to be undecorated (Lofstrom et al. 1982; Price 1981).
Potential errors: Whiteware is easily recognized.
Cultural-historical position: While a colonial pottery is

believed to have utilized white-burning clay in the 1680's, whiteware was not commonly produced until 1825 onward.
Research value: Whitewares were usually printed or impressed with a maker's mark after the Civil War. Identification of these marks (e.g., Gates and Ormerod 1982; Godden 1964; Kovel and Kovel 1953) can help determine the time of site occupation and commerce patterns. Whenever possible, maker's marks are used for dating historic ceramics in the present study. It has been suggested that decorative techniques and motifs may be useful in dating historic sites of the circa 1810 to 1870 period (Lofstrom et al. 1982; Price 1981), but since the project area was not actively settled until the 1870's this dating technique has not been employed in the present study.

STONEWARE
Definition: A ware manufactured from a more or less white, fine-grained clay fired at about 2200 degrees Fahrenheit. It is steel-hard and non-porous. The exterior is often salt-glazed. The interiors are frequently covered with a dark-brown coating known as Albany slip. It is typically decorated with cobalt aluminate, a dark-blue pigment. Stoneware is usually in the form of crocks and jugs.
Potential errors: It is usually easily recognized.
Cultural-historical position: Stoneware was manufactured in the 18th century, but was mass produced in the mid-19th century. It suffered a decline in manufacture after 1875, but is still being produced.
Research value: Stoneware often bears a maker's mark. Identification of the mark can help determine the time of site occupation and commerce patterns.

BRICK
Definition: A material manufactured from surface clays. It is relatively soft and porous. It is usually rectangular in shape, with a width of four inches.
Potential errors: Brick is usually easily recognized.
Cultural-historical position: Bricks were manufactured during Euro-American settlement and are currently manufactured in large quantities for building material.
Research value: Bricks suggest the former presence of a house and/or chimney of a structure. They may also represent remains of foundations of structures.

BOTTLE GLASS
Definition: Any piece of curvilinear glass that appears to have been from a glass container.
Potential errors: Bottle glass is usually easily recognized, although fragments of a drinking glass may be confused with it.
Cultural-historical position: The height of mold seams on bottle necks are indicative of the time of manufacture (Adams 1971; Santeford 1981). Identifiable maker's marks are also useful for dating bottles (e.g., Toulouse 1971). Complete bottles with content labels pressed into the glass are also datable (e.g., Baldwin 1973).

Research value: Glass bottles are sometimes good temporal indicators, but it is important to remember that the dates based on the height of mold seams are not necessarily precise when applied to the dating of historic sites. They are only meant to give general time references. Older style molds were not immediately discarded with the introduction of new ones. As much as 10 to 15 years may have occurred between the introduction of new molds and processes and their general acceptance. In addition, bottles are reusable, thereby, extending their period of usefulness. Identification of bottle contents is sometimes possible.

WINDOW GLASS
Definition: Any piece of uniformly flat glass.
Potential errors: Window glass is easily recognized.
Cultural-historical position: Window glass is usually associated with Euro-American occupations.
Research value: Window glass is indicative of the former presence of some form of building.

METAL
Definition: Any piece of metallic material.
Potential errors: Metal is easily recognized.
Cultural-historical position: Most metal is of historic, Euro-American origin. Some metal, particularly copper, may be of prehistoric origin.
Research value: Metal fragments can oftentimes be identified as to their tool types and function. They are indicative of historic and/or proto-historic occupations of a site.

CHAPTER 5
Site Descriptions

The following are the site descriptions and associated artifacts recorded during this project. A site is defined as the locus of past human activities that can be delineated by the presence of cultural features (houses, storage pits, hearths, ditches, etc.) and/or cultural artifacts (tools and debris). The sites are assigned numbers according to the Smithsonian Institution trinomial numbering system. The first two digits refer to the states (21 is for Minnesota and 39 is for South Dakota), the second two digits designate counties (RO for Roberts County and TR for Traverse County) and the third set of digits refer to the sequential site numbers recorded for each county.

39RO44
Karsbrek Site

Legal Location	Section	Township	Range
W1/2 SW1/4 SW1/4 NW1/4	23	127N	48W

UTM	E683100 N5069900
Map Quad	Rosholt
Type of Remains	historic artifacts
Elevation	299 meters (980 feet)
Vegetation	grass, trees, cultivated
Estimated Size	5 hectares
Surface Visibility	0 to 100 percent
Topography	terrace or beach of Mud Lake
Distance to Nearest Water	100 meters
Soil Association	GyA, Glyndon silt loam, 0 to 3 percent slopes
Cultural Affiliation	Euro-American, ca. 1904-1940

Description

The site is located on flat ground near the Reservation Dam and roadside park between Lake Traverse and Mud Lake (Figs. 7, 23-25). The surface soils are primarily Glyndon silt loams that were formed in lacustrine silt. According to the Soil Conservation Service these soils have a high lime content (Miller, Koopman, and Glover 1977). The site consists of a mound of earth approximately 10 meters in diameter and a very thin surface scatter of historic artifacts.

The site area was originally part of the Lake Traverse Reservation (Sisseton and Wahpeton Reservation) that was created by an act of Congress on February 19, 1867, and proclaimed in May, 1867 (Kappler 1904:953-55). The General Allotment Act of February 8, 1887 divided the reservation lands into individually owned land allotments of 64.8 hectare (160 acres) for each individual of the tribe, including women (Kappler 1904:430). For the Lake Traverse Reservation in particular, the Agreement of December 12, 1889 (Ratified by Congress on March 3, 1891) established allotments for the Sisseton and Wahpeton. A Proclamation, by President Benjamin Harrison on April 11, 1892 opened the reservation to Euro-American settlement to begin at noon, on April 15, 1892.

The land, on which site 39RO44 is located, was originally allotted (Allotment Number 91200) to Ide de Win Sweetcorn on June 19, 1889. She died when she was eight years old. The date of her death is not known but the land went through probate and her father, Arthur Sweetcorn, inherited the land on April 21, 1904. On the same date he was permitted to sell the land and transfer the deed to non-trust status. He sold the land in 1904 to Ole Karsbrek (Land Index for Sisseton Reservation, Titles and Records Section, Aberdeen Office, Bureau of Indian Affairs). The records and literature search did not yield any information pertaining to whether Ide de Win Sweetcorn was a relative of Chief Sweetcorn. There

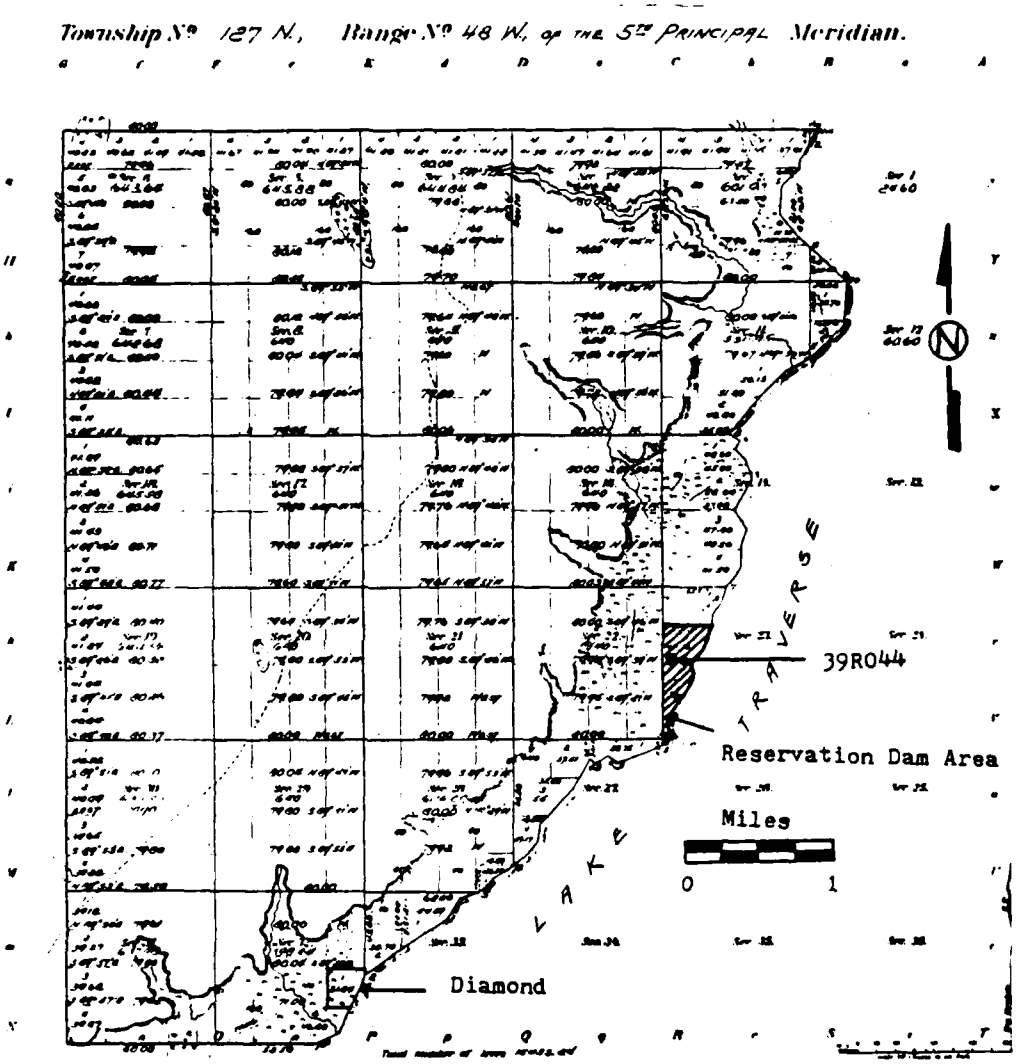


Figure 23. General Land Office map (GLO), ca. 1870, T127N, R48W, showing location of site 39RO44 and west end of Reservation Dam area.

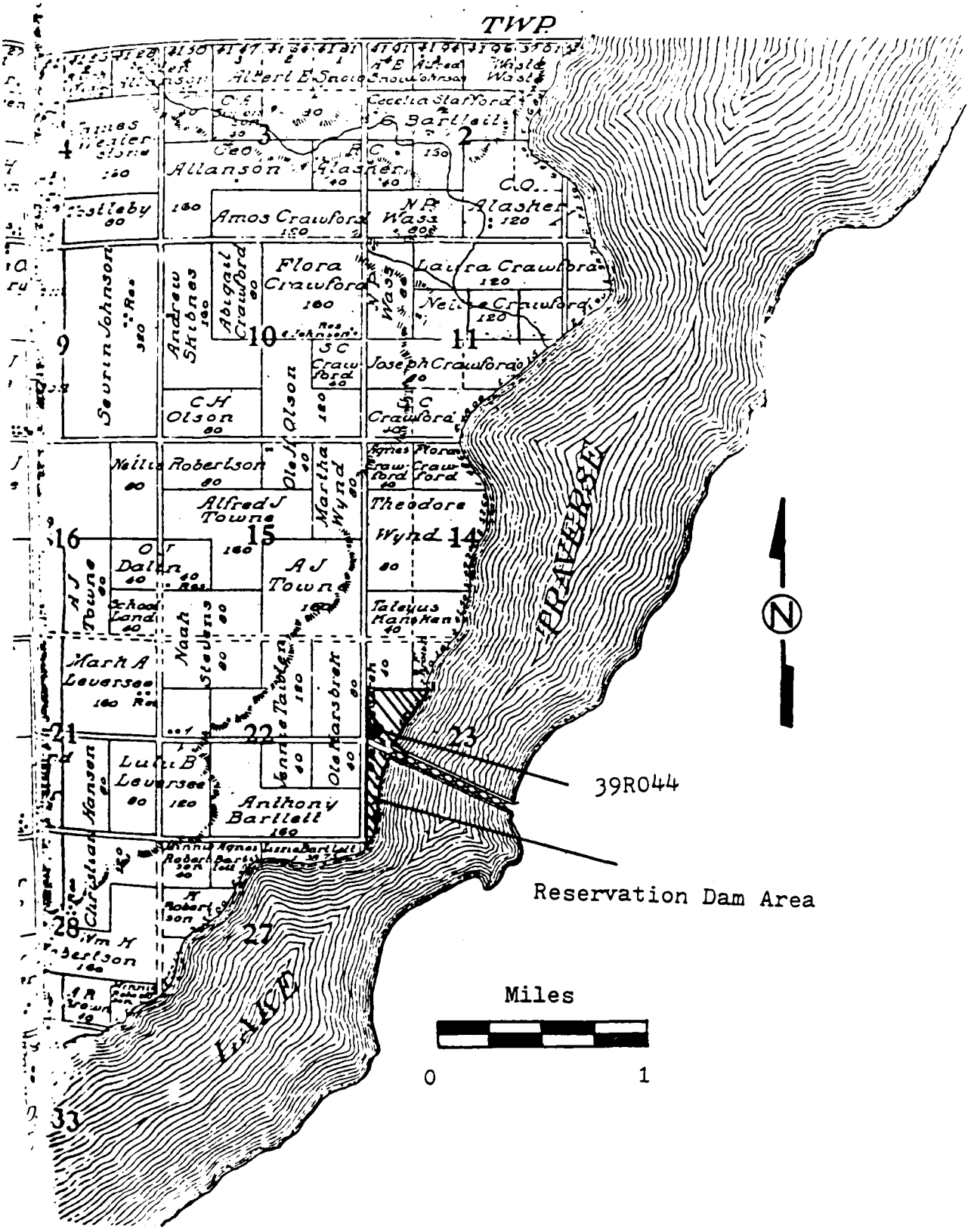


Figure 24. Roberts County atlas map of Harmon Township, ca. 1910.

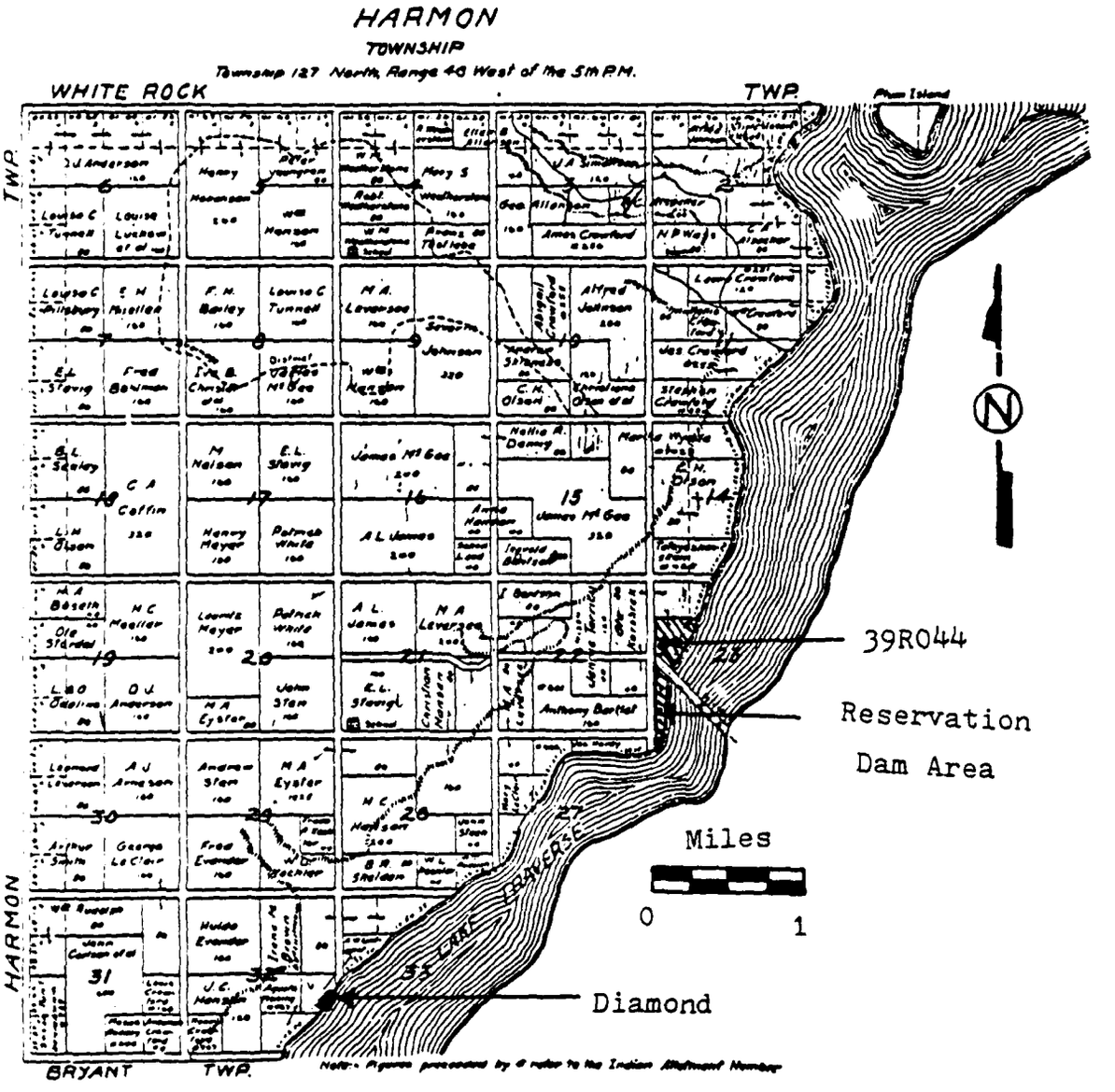


Figure 25. Roberts County atlas map of Harmon Township, ca. 1930 - 1950.

were no buildings on the property (which is now Corps lands) prior to the purchase of the land by Ole Karsbrek.

O'Donald Simonson, a neighbor (personal communication) estimates that Karsbrek built his house and barn at the farmstead shortly after 1904 since the buildings are known to have been built by Karsbrek and not by previous owners (i.e., Arthur Sweetcorn). Examination of the 1910 and 1930 Harmon Township Atlas maps (Figs. 24-25) show Ole Karsbrek as the owner of the property, but no buildings are designated on the maps. This suggests the residence was built and subsequently destroyed sometime between 1910 and 1930. The records search did not yield specific information regarding the construction of the buildings. According to Simonson and Mrs. Harold Gibson (personal communication), a former renter, there was nothing architecturally significant about the buildings. In the late teens or early 1920's Karsbrek began renting the farmstead. His renters were, in chronological order, Julius Colt, (1922) Leonard Carl, Conrad Herman, and Carl Bock, who was the last man to live on the place.

In the early 1930's the U.S. War Department took over this piece of land with the intention of building a dam, though final condemnation did not occur until 1944. Simonson said "eminent domain" was reason enough at that time to condemn lands. Whether the buildings were moved or burned could not be remembered by several neighbors. Also, after the farmstead was removed, the contractor who built the dam camped on the lot between where the buildings used to be and the dam (O'Donald Simonson, personal communication). Figure 26 is a sketch map showing the relative locations of the contractor's camp and the buildings based upon information provided by Simonson.

Originally, because of the quality of denseness of the soil, it was intended to use this piece of land for a borrow area. The lot would have ended up being a lake and the earth strippings would have been used to build the dam. Strippings from the borrow area on the south edge of the lot were stockpiled a little farther north inside the lot, but the War Department found the same type of soil along where they were building the dam so these soils were used (it was 1934 and very dry, so this was possible) and the strippings from Lot 2 were left on Lot 2. As it happened, some of these strippings were placed where the farm house once stood (Simonson, personal communication).

A mound of earth, approximately 10 meters in diameter, marks the approximate location of a house. A 1 x 1 meter pit was manually excavated near the center of the earthen mound (Fig. 27). The southwest corner of the test pit was located 39 meters east and 65 meters north of the northeast corner of a small bridge at the intersection of a north-south gravel road (which passes west of the site) and Highway 17 (Fig. 27). The test pit was excavated in arbitrary 10 cm levels to

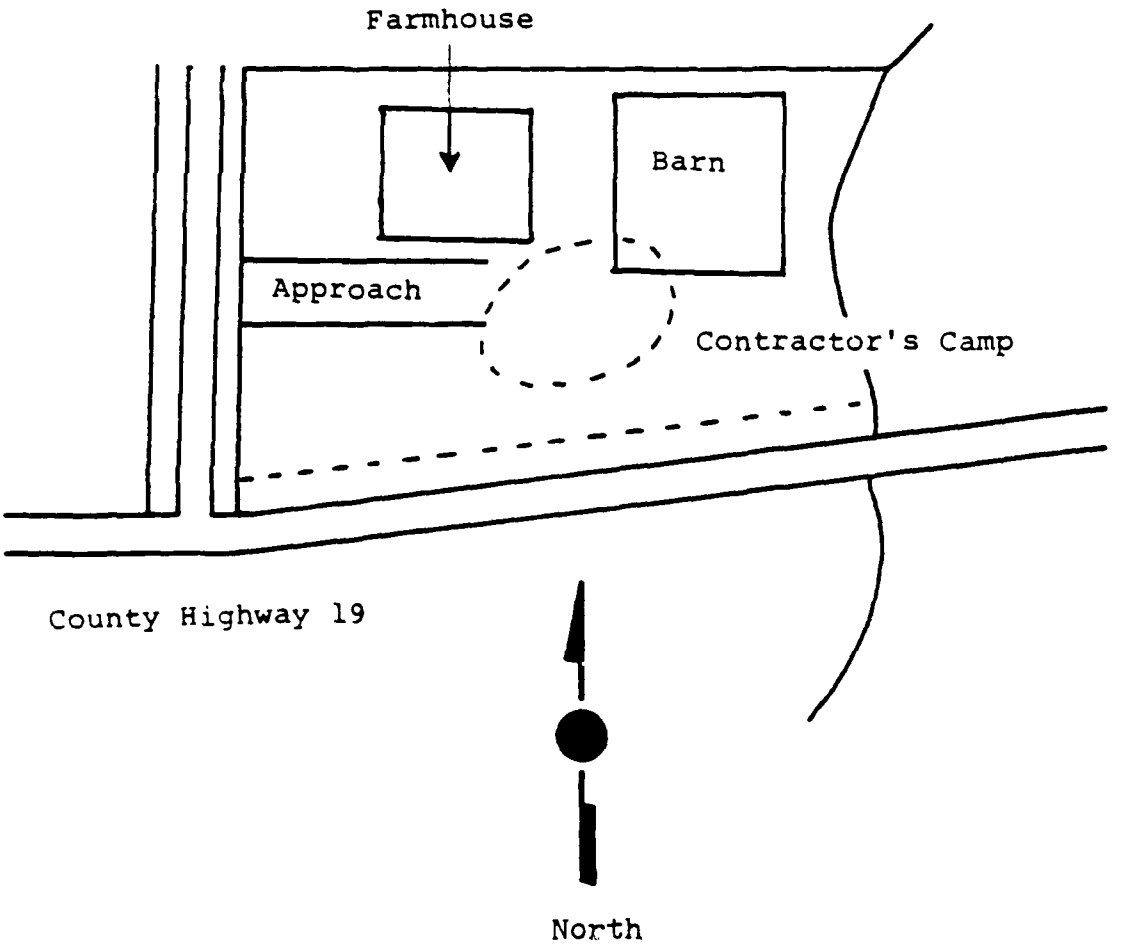


Figure 26. Sketch map of site 39R044 showing the relative locations of the farmhouse, barn and contractor's camp.

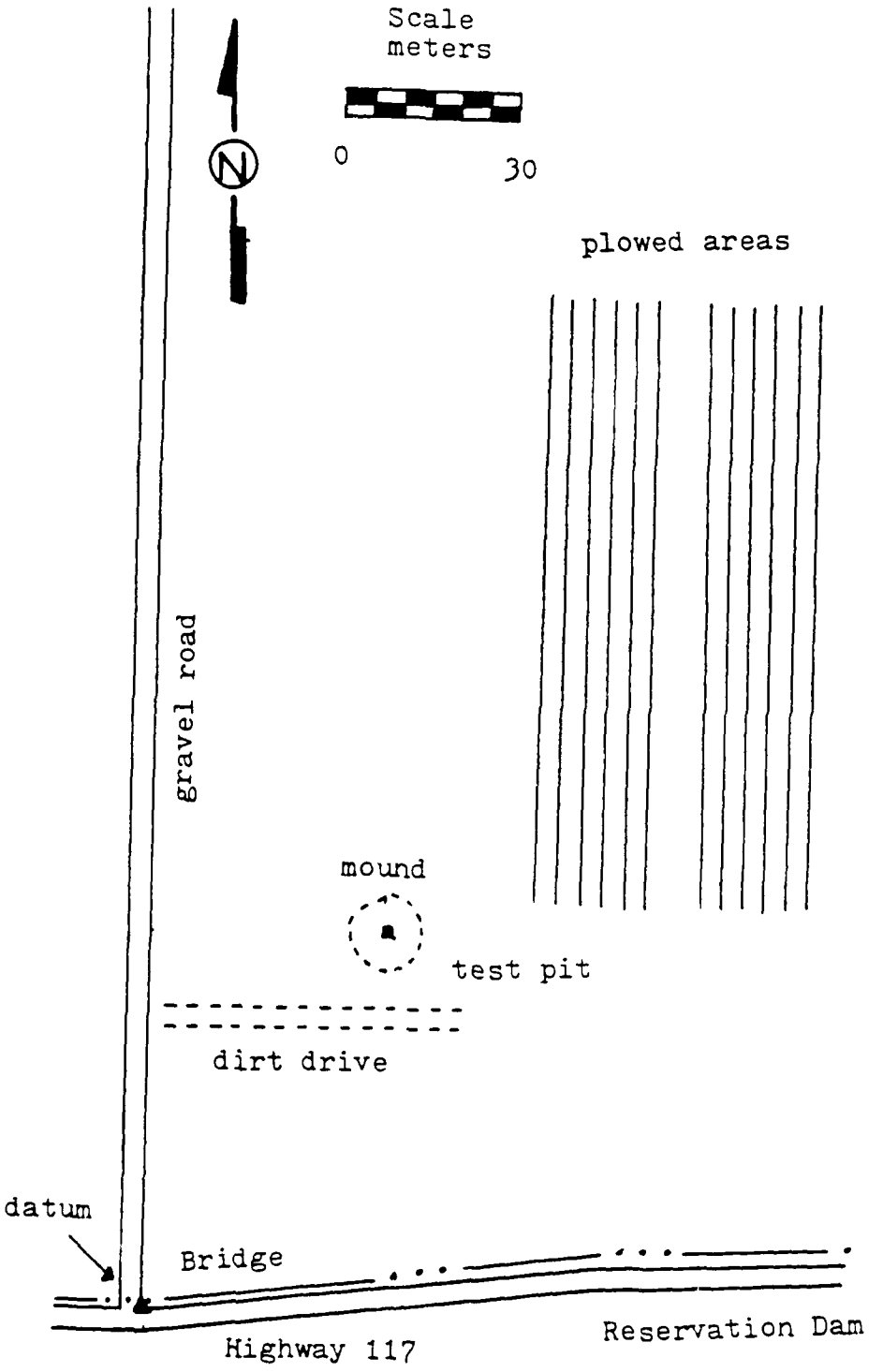


Figure 27. Excavation map of site 39R044.

a depth of 40 cm. An oakfield core was taken at the bottom of the 40 cm pit. The core was made to a depth of 60 cm below the bottom of the pit. Evidence of cultural remains, consisting of charcoal, bone fragments, and obstructions (i.e., large rocks) were encountered the whole depth of the core. No stratigraphy was discerned (Fig. 28b). A large quantity of large stones, historic artifacts and animal bones were recovered from the test pit.

Because a dense concentration of cultural material was recovered from the test pit, and extends to a depth of at least one meter, the information provided by Simonson (personal communication) about soil strippings being placed over the house may be exaggerated. The placement of the artifacts and rocks within the test pit suggests minimal overburden. The large rocks were not placed in any orderly pattern indicating a foundation, but occurred haphazardly within the deposit. Therefore, a stone foundation was not delineated. It is doubtful that soil strippings would have such a dense concentration of rocks and artifacts. Natural geomorphic processes would not have assimilated these cultural remains in the context in which they occurred. Therefore, the authors believe very little soil strippings were placed over the house remains. Rather, the mound of earth may represent an attempt by Ole Karsbrek to build a residence on an artificially constructed earthen mound to reduce the likelihood of flooding on this low lying, flat land adjacent to Lake Traverse.

The test pit was placed in the center of the mound because several rocks, believed to be possible remnants of a foundation, were visible beneath the grasscover (Fig. 29). The test pit was excavated to a depth of 40 cm because large rocks were encountered that would have required the expansion of the 1 x 1 meter pit to at least a 2 x 2 meter excavation. This would have required a substantially greater amount of monies and time to excavate. Results of the use of an oakfield core indicate cultural remains are continuous and extend to a depth of at least one meter. The historic artifacts all appear to date no earlier than 1900. The variety of historic artifacts suggests a habitation structure once existed at this location. The dishes, glass and metal artifacts indicate household utilitarian items. The faunal remains suggest the inhabitants utilized locally available resources for food, including fish, deer and jackrabbit. Cattle and chickens were probably raised and eaten at the farm site. With the exception of one small piece of melted glass and some small flecks of charcoal, there is no other evidence that the house may have burned. Except for a thin surface scatter of historic pottery, no evidence of any outbuildings was discerned.

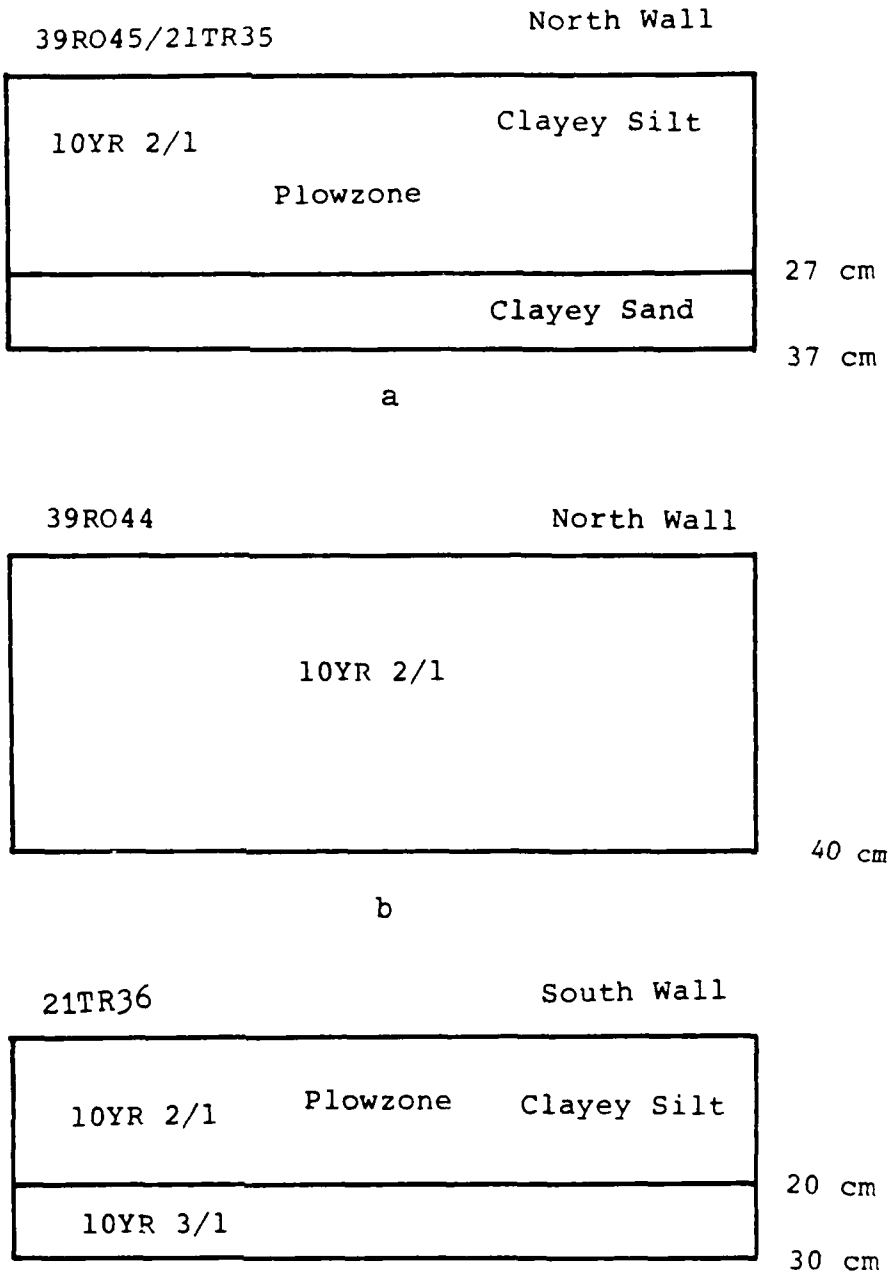


Figure 28. Soil profiles of the three sites: (a) site 39RO44; (b) site 39RO45/21TR35; and (c) site 21TR36.

a

b

Figure 29. a. Photograph of site 39RO44, looking east.
b. Photograph of test pit at site 39RO44.

HISTORIC ARTIFACTS

Provenience and Artifact Type	Quantity	Material Type	Remarks
Surface:			
Brick	1 frag.	clay	-
Crock	1 neck	stoneware	gray surfaces
	1 base	stoneware	dark brown interior
	3 body sherds	stoneware	1 salt-glazed exterior, 2 gray surfaces
Tableware	3 rims	whiteware	plain
	1 handle	whiteware	molded
	11 body sherds	whiteware	9 plain, 2 molded
Bottle Glass	2 frags.	1 clear	-
		1 amethyst	
Canning Jar Lid	1 frag.	milk glass	-
Liner	1 complete	milk glass	-
Canning Jar Lid	1 frag.	zinc	-
Coal	1	coal	-
Nail	1	metal	-
U-Bolt w/attached Ring	1	iron	-
Strap Metal	1	iron	-
Test Pit:			
Utilitarian Ware	1 frag.	whiteware	plain
Tableware	5 rims	4 whiteware	2 gilt, 2 plain
		1 porcelain	gilt
	1 base	whiteware	plain
	3 body sherds	whiteware	plain
Bottle Glass	2 necks	1 light blue, 1 clear	1 crown top, post-1903
	3 bases	2 clear, 1 yellow	-
	11 frags.	5 dark blue, 3 light blue, 1 amber, 2 clear	2 embossed, - , 1 red painted exterior
Decorative Glass	1 frag.	clear	very thin
Window Glass	34 frags.	19 light green, 15 light blue	-
Melted Glass	1	clear	-
Button	2	1 shell	2 center holes
		1 aluminum	4 center holes
Footwear	3 frags.	1 leather	-
		2 rubber	
Cement	1	cement	-
Coal	14	coal	-
Canning Jar Lid	2 complete	milk glass	-

Liner			
Canning Jar Lid	2	zinc	-
Cosmetic Jar Cap	1	aluminum	with incised female profile
Shotgun shell	1	12 gauge	hi-power, "Federal"
Tin Can	2	steel	1 rectangular, 1 round
Lock Plate	1	metal	for a door
Alarm Clock	1	metal	wind-up type, internal parts
Handle	1	round wire	-
Wire	3	metal	-
Wire Nail	6 complete	1: 20d, or 30d 2: 9d, 3: 12d	- 1 finishing
Washer	3 frags.	metal	-
Misc. Metal	15 frags.	12 iron, 3 zinc	-

FAUNAL REMAINS

Provenience Taxon	Element	No.	Side	Condition	Remarks
Surface:					
Lepus sp. (Jackrabbit)	tibia	1	left	distal	-
Deer-size	rib	1	-	medial shaft	-
Bos/Bison size	mandible	1	left	horizontal ramus	-
	lumbar vertebra	1	axial	left lateral	-
	rib	1	-	medial shaft	-
	2nd phalanx	1	left	nearly complete	-
Unidentified	bone	3	-	fragments	-
Test Pit:					
Ictalurus sp. (catfish)	cleithrum	2	1 left 1 right	complete fragment	-
	opercle	2	right	complete	-
	pectoral spine	1	left	proximal	-
Unidentified Fish	dentary	1	left	complete	-
	articular	1	right	complete	-
	preopercle	1	right	complete	-
	opercle	3	2 left, 1 right	complete	-
	basipterygium	1	right	complete	-
	bone	6	-	fragments	-
Bird (chiken-size)	ulna	1	left	fragment	-
Rodent	tibia	1	left	complete	-
Ondatra zibethicus (muskrat)	calcaneum	1	left	complete	-
Canid-size	lumbar vertebra	1	axial	left lateral	-
Deer-size	vertebra	1	axial	centrum frag.	-
	bone	1	-	fragment	-

Unidentified	bone	6	-	fragments	2 burned, 1 sawed
Freshwater Mussel	shell	1	-	fragment	-

Recommendations

Site 39RO44 is a historic site consisting of a destroyed farmstead that dates sometime between 1904 and 1940. From information provided by local residents, and a deeds search at the Roberts County Courthouse, the site was used as a farmstead. Minimal test excavations indicate remains of the house (i.e., cement, stones, lock plate, nails, brick) and associated artifacts (glass, whiteware, procelain, faunal remains) are present. Cultural remains extend to a depth of at least one meter. The historic site does not have any significant persons associated with it. The site may warrant further testing in order to determine the nature of the structures that were formerly present and its significance. However, the house location, being surrounded by trees and occurring within a raised mound, is not presently in any danger from flooding or agricultural (food plots) activities. Unless future land alterations are planned for this locality, the site will be preserved in its present condition.

39RO45/21TR35

Legal Location	Section	Township	Range
NE1/4 SE1/4 SW1/4	29	125N	49W
S1/2 NE1/4 SW1/4	29		
SE1/4	29		
NE1/4 NE1/4	32		
W1/2 NE1/4	31		
E1/2 NE1/4	31		
E1/2	30		

UTM	E667600 N5052000
Map Quad	Browns Valley
Type of Remains	flakes, ceramics, points, bone, mauls
Elevation	296 to 299 meters (970 to 980 feet)
Vegetation	grass, trees, cultivated
Estimated Size	90 hectares
Surface Visibility	0 to 100 percent
Soil Association	Pm, Playmoor silty clay loam, 0 to 2 percent slopes; La, LaDelle silt loam, 0 to 2 percent slopes
Topography	terrace, lakebed
Distance to Nearest Water	0 meters
Cultural Affiliation	prehistoric, Late Woodland

Description

Site 39RO45/21TR35 is approximately 0.8 kilometer (one-half mile) northwest of the northwest corporate boundary of Browns Valley, Minnesota (Figs. 8, 13, 30). The site is adjacent to a U.S. Army Corps of Engineers flood control structure at the head of Lake Traverse. A plowed field contains scattered cobbles of granite, limestone, and some unidentified igneous rocks. The rocks were most likely derived from the till uplands and deposited during formation of the Little Minnesota River alluvial fan.

Pedestrian reconnaissance on Corps lands and adjacent private lands indicate most of the site is located on privately owned lands. The site consists of a thin surface scatter of prehistoric artifacts that includes projectile points, pottery, flakes, grooved mauls, hammerstones, bone, etc. The farmer who has farmed the adjacent land informed the field team that he has collected numerous grooved mauls from the site, which extends south of Highway 10. An arbitrary collection of surface artifacts was made on portions of the site. The site, which occurs on higher terrain, is bounded on the north by lower lying wetlands.

A 1 x 1 meter test pit was manually excavated on Corps lands at the northern edge of the site. The southwest corner of the test pit was placed four meters north of a brass Corps boundary survey marker (Figs. 31 and 33). This test pit

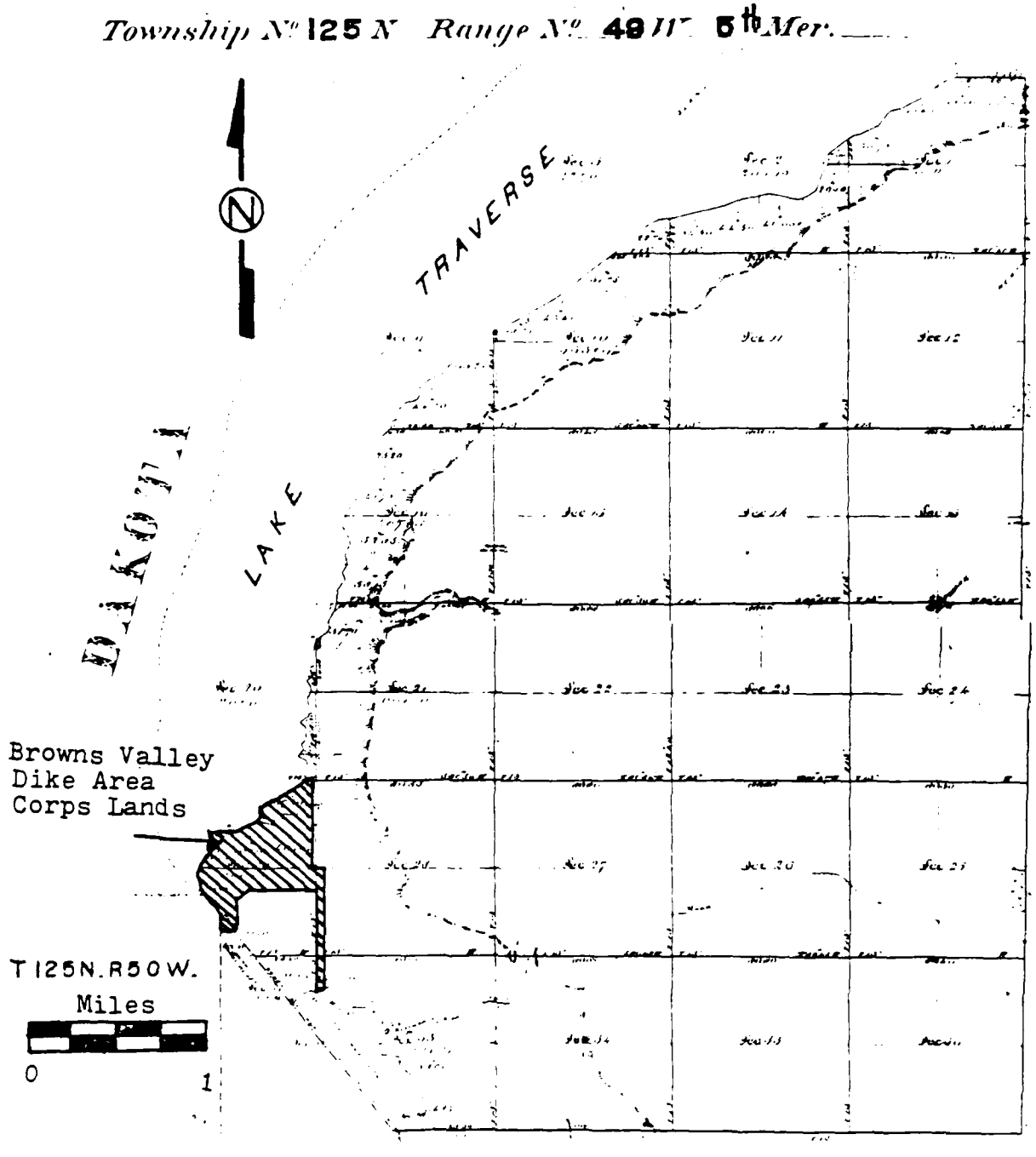


Figure 30. Government Land Office map of Minnesota, ca. 1870. T125N, R49W.

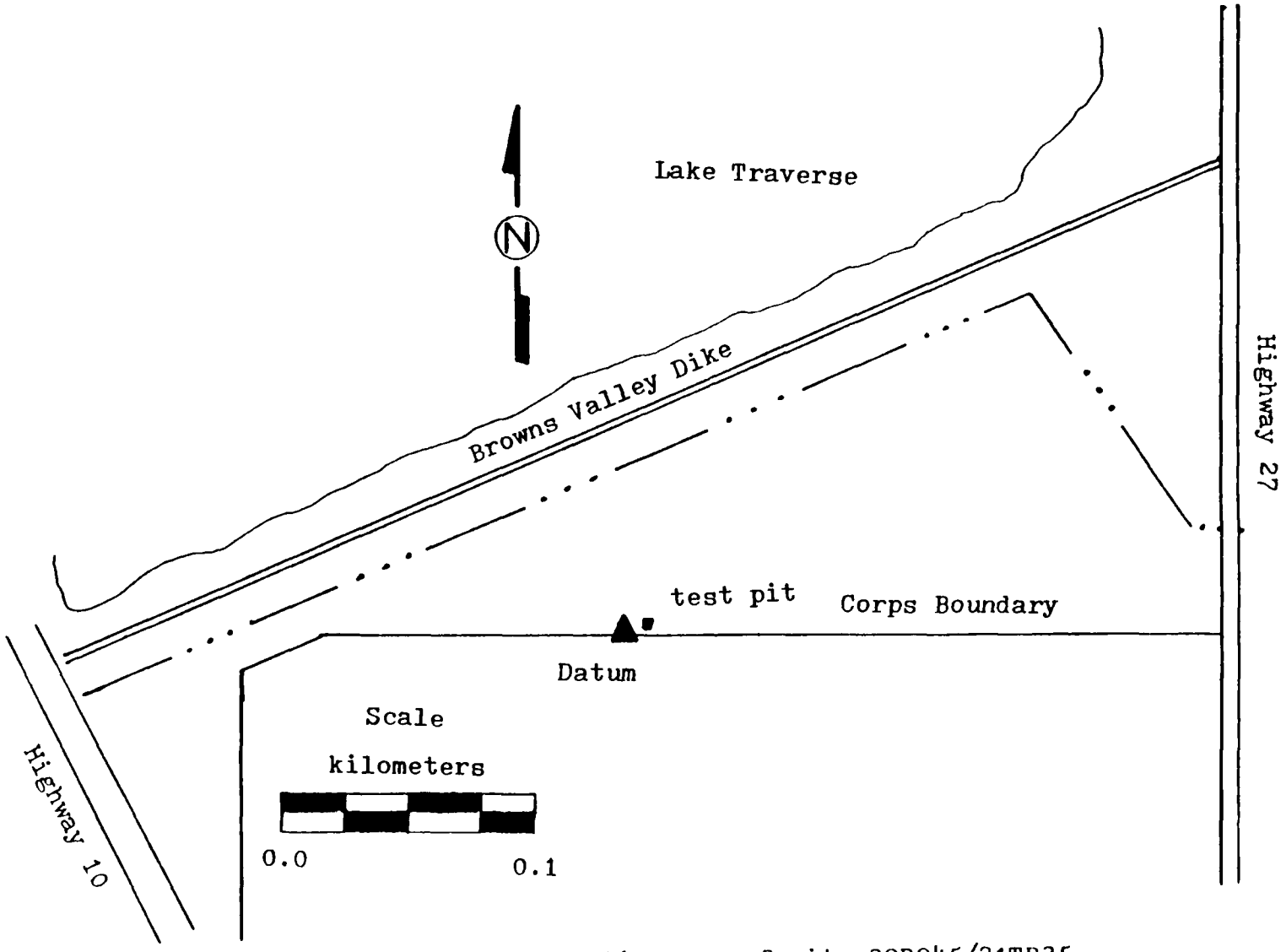


Figure 31. Excavation map of site 39RO45/21TR35.

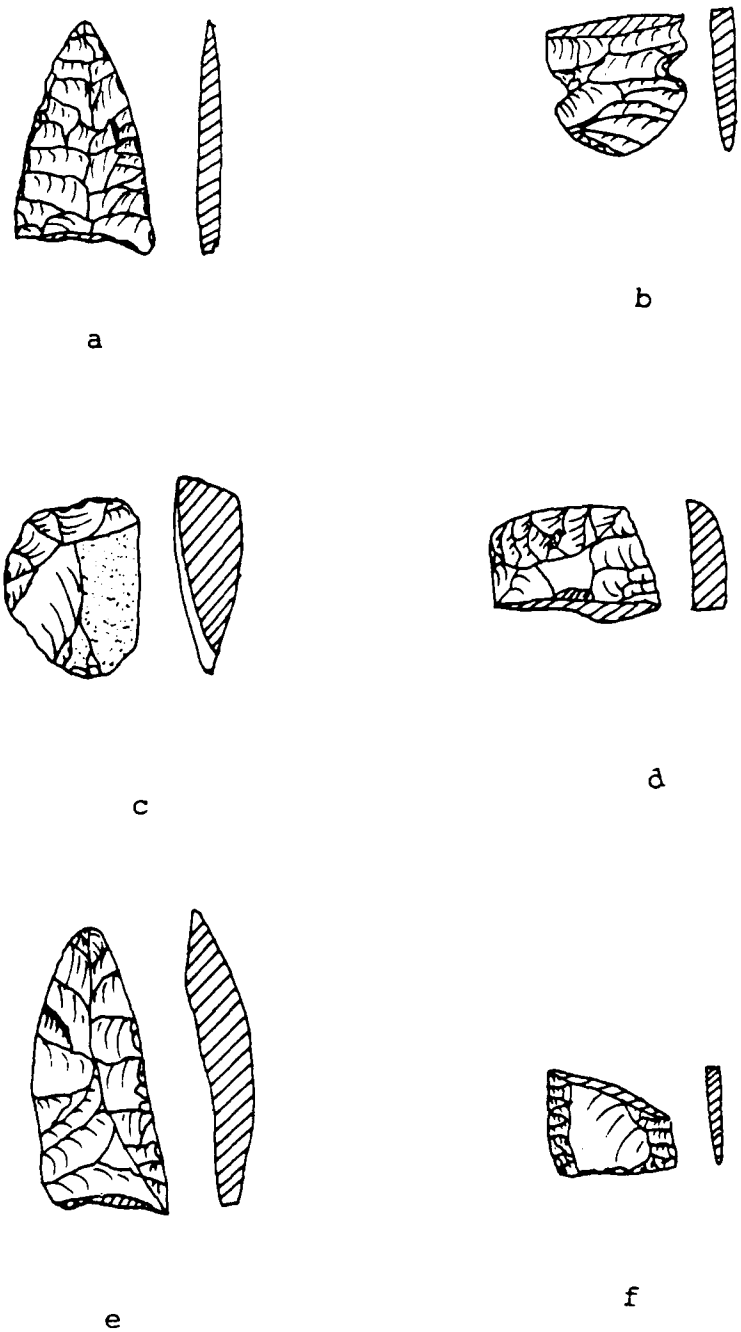
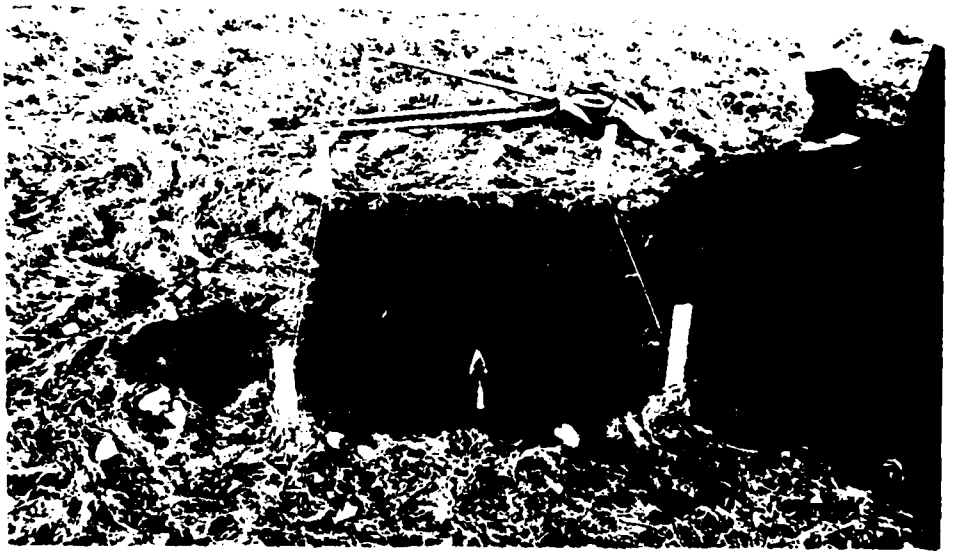


Figure 32. Artifacts from the sites: (a) Projectile point S-45, 39RO45/21TR35; (b) Projectile point base S-46, 39RO45/21TR35; (c) Endscraper S-49, 39RO45/21TR35; (d) Endscraper fragment S-48; 39RO45/21TR35; (e) Knife S-47, 39RO45/21TR35; and (f) Projectile point base S-1, 21TR36. Tools shown actual size.

a



b

Figure 33. a. Photograph of site 39RO45/21TR35, looking north.
b. Photograph of test pit at 39RO45/21TR35.

location was chosen because of the relatively higher ground at this area and its closeness to an area (on private land) from which pottery sherds were collected. Also, the fact that shovel tests on Corps of Engineers lands adjacent to areas where artifacts were recovered from the surface did not yield any evidence of cultural remains, was another determining factor in selecting the placement of the test pit. The test pit was excavated to a depth of 37 cm (Fig. 28a). A flake and pieces of charcoal were recovered from a depth of 28 cm. The plowzone extends to a depth of 27 cm. An oakfield core was taken at the bottom of the test pit to a depth of 60 cm. No evidence of cultural remains and/or stratigraphy was discerned. The minimal test excavation confirms the presence of subsurface cultural remains. The site's location near the edge of Lake Traverse (pre-dam) and the presence of clayey sand deposits at the bottom of the test pit and within the soil core indicate these are lake deposits and that it is unlikely that deeply buried cultural deposits are present at this location.

The temporally diagnostic artifacts from the site include pottery and projectile points. The projectile points are medium size side-notched and corner-notched forms (Figs. 32a,b) indicative of Late Woodland cultural complexes. The ceramic assemblage includes one rim sherd, one neck sherd, and 42 body sherds. The assemblage is very homogeneous. All of the sherds are shell tempered with cordmarked exeriors (some have eroded and exfoliated exteriors). The rim sherd has a stick-impressed lip. The ceramic assemblage is unlike any reported in the immediate project region. The shell tempering indicates a Mississippian influence, while the cordmarking suggests an earlier Late Woodland influence. Similar ceramics were recovered from site 39BK7 in Brookings County, South Dakota (Hannus 1981).

Examination of the literature and Sandy Lake ware sherds collected by Michlovic at Moorehead State University suggests an affiliation with Sandy Lake ware, which has both a smoothed and a vertically cordmarked series. Sandy Lake ware has a chronological position of A.D. 1000 to 1750 and a geographic distribution in northern Minnesota and southern Ontario and Manitoba. A large number of sites along the Red River Valley in Norman County, Minnesota, which is located approximately 161 kilometers (100 miles) north of site 39RO45/21TR35, have components with Sandy Lake ware present. The southern sites have high percentages of shell tempered pottery while more northerly sites have a high percentage of grit tempered pottery. Decoration, when present, is limited to lip notching or decorations (Anfinson 1979:175-182). There is little doubt that the inhabitants of the site were influenced by more easterly Mississippian complexes. More specific cultural/temporal placement is not possible with the present data.

The faunal remains recovered from the site indicate

bison and deer were procured by the site's inhabitants. The recovery of domestic cat and *Bos* are attributed to historic occupation of the area. The recovery of a variety of stone tools, pottery sherds and faunal remains suggests the site was used for a variety of generalized tasks (i.e., hunting, butchering, scraping, lithic tool manufacture, pottery manufacture, cooking, etc.). The very thin surface scatter of artifacts in the cultivated field (100 percent visibility) suggests temporary use of the site as opposed to a permanent village. The center of the site is located approximately 0.8 kilometers (one-half mile) northwest of the Sam Brown memorial Park in Browns Valley, Minnesota. The southeast edge of the site is only about 0.4 kilometers (one-fourth mile) northwest of the park, which is reported to have been the location of Standing Buffalo's Village (Allanson 1958:6). Due of the lack of specific locational information regarding Standing Buffalo's Village, portions of the present site, 39RO45/21TR35, may have been a part of his village. However, the northern portion of the site, where the ceramics were collected, is attributed to an earlier prehistoric occupation on the basis of the ceramic styles present (Sandy Lake ware).

PREHISTORIC ARTIFACTS

Provenience Artifact Type	Quantity	Material Type	Remarks
Surface:			
Pottery	1 rim sherd	shell temper	cordmarked exterior stick impressed lip
	1 neck frag.	shell temper	cordmarked
	42 body sherds	shell temper	33 cordmarked, 9 eroded
Projectile Points	2 frags.	chert	1 blade element corner-notched, 1 base: side-notched
Knife	1 frag.	Tongue River silicified sediment (TRSS)	-
Biface	2 frags.	1 TRSS, 1 chert	-
Endscrapers	1 complete	chert	-
	1 frag.	TRSS	-
Grooved Maul	1 frag.	granite	-
Hammerstone	1	granite	-
Flakes	35	28 chert, 4 TRSS 1 Knife River Flint, 1 quartz, 1 quartzite	-
Shatter	7	chert	-

Test Pit:			
Retouched Flake	1	chert	-
Charcoal	0.0 g.	-	-

FAUNAL REMAINS

Provenience and Taxon	Element	No.	Side	Condition	Remarks
Surface:					
Felis domesticus (cat)	axis vertebra	1	axial	complete	-
	lumbar vertebra	1	axial	nearly complete	-
	femur	1	right	complete	-
	pelvis	1	left	acetabulum	-
Canis sp.	upper canine	1	-	fragment	-
	upper M1	1	right	posterior	-
Deer-size	rib	2	-	shafts	-
	ulna	1	left	proximal	-
	bone	3	-	fragments	-
cf. *Bos taurus* (cow)	humerus	1	right	disto-medial	sawed
Bison bison	2nd phalanx	1	left	complete	-
cf. *Bison bison*	horn core	1	-	fragment	-
	upper P4	1	right	complete	-
	upper molar	1	-	fragment	-
Bison-size	mandible	1	left	ascending ramus	-
	vertebra	2	axial	fragments	-
	scapula	7	5 left	3 distal, 1 blade frag., 1 posterior	-
			2 ?	fragments	-
	humerus	3	2 left	disto-lateral	-
			1 ?	proximal	unfused epiphysis frag.
	trapezoid-magnum	1	left	medial	-
	metacarpal	1	left	proximo-anterior	-
	tibia	3	2 left	1 proximo-anterior shaft	-
				1 medial shaft	-
			1 right	proximo-posterior shaft	-
	astragalus	1	left	lateral	-
	proximal sesamoid	2	1 right	complete	-
			1 ?		
	distal sesamoid	1	left	complete	-
	bone	24	-	fragments	-
Unidentified	bone	8	-	fragments	2 burned
Freshwater Mussels	shell	20	-	fragments	-

Test Pit:					
Rodent	humerus	1	left	fragment	-
Freshwater Mussel	shell	3	-	fragments	-

Recommendations

Site 39RO45/21TR35 contains a Late Woodland occupation dating after A.D. 1000. The extent of the site indicates either a large village or repeated seasonal occupation of the area over a long period of time. A literature search indicates the south end of Lake Traverse was a favorite camping ground of the historic Dakota. The area was particularly favored for winter villages (Allanson 1958:6). Early Euro-American accounts place Standing Buffalo's Village near this site location. However, the ceramics recovered from the site, assigned to Sandy Lake ware, indicate the northern portion of the site (on Corps lands) was occupied by earlier, Late Woodland peoples. On the basis of present information the site is considered potentially significant.

The test excavation ascertained the presence of subsurface cultural remains. Therefore, there is a possibility cultural features, such as hearths, storage pits, and post molds indicative of shelters, may also be present. However, the site location is not suitable for the presence of deeply buried cultural components based upon the geomorphic history of processes operative at the site. It is recommended that portions of the site located on Corps lands be protected from any future land alterations in order to preserve its integrity. The site is presently not in any danger and further avoidance of the site should maintain its integrity. If future land alterations are planned, it is recommended that a systematic testing program be implemented to determine the site's significance and eligibility for nomination to the National Register.

Legal Location	Section	Township	Range
SW1/4 SW1/4	27	128N	47W

UTM	E688700 N5081500
Map Quad	Wheaton West
Type of Remains	flakes, projectile point fragment
Elevation	297 to 300 meters (975 to 985 feet)
Vegetation	cultivated (beans)
Estimated Size	12 hectares
Surface Visibility	50 percent
Topography	slope and terrace/beach
Distance to Nearest Water	200 meters
Cultural Affiliation	prehistoric (unknown affiliation)

Description

Site 21TR36 is adjacent to the White Rock Dam that controls water flow of the Bois de Sioux River (Figs. 3, 34, 35). Surface soils are primarily Antler-Colvin silt loams that were formed in glacial lake sediment overlying till (Miller, Koopman, and Glover 1977). The many stones and boulders on the surface were lag deposits from the bed load of Glacial River Warren or are remnants of glacial till where the finer sediment was washed away during the late stages of discharge through the River Warren channel (Matsch, Rutford, and Tipton 1972).

The site consists of a very thin lithic scatter. The total site area is under cultivation. A 1 x 1 meter test pit was manually excavated. The southwest corner of the test pit was 233 meters east and 95 meters north from the northeast corner of the bridge over the water control structure at White Rock Dam (Figs. 36 and 37). The test pit location was chosen because this was where the projectile point fragment was recovered from the surface. Although the entire site area was carefully examined, with surface visibility being approximately 50 percent, only one projectile point fragment, seven flakes, three pieces of shatter, and five animal bone fragments were recovered. The artifact density is only approximately one item per 7,588 square meters. There were no concentrations of artifacts on the surface to use as a better location for placing a test pit. The projectile point fragment (Fig. 32f) is not large enough to assign to a particular style and/or cultural affiliation. The faunal remains may be attributed to either prehistoric or historic use of the site area. The test pit was excavated to a depth of 30 cm. The plow zone extends 20 cm deep (Fig. 28c). The plowzone consists of a clayey silt while the subsurface soil consists of clayey sand. A large quantity of glacial till, consisting of gravel, occurs over the entire site area. The glacial till, which was deposited by the bed load of Glacial River Warren, indicates the site area would not have buried cultural components. Due to the geologic history and geomorphic processes at this site location, it was determined

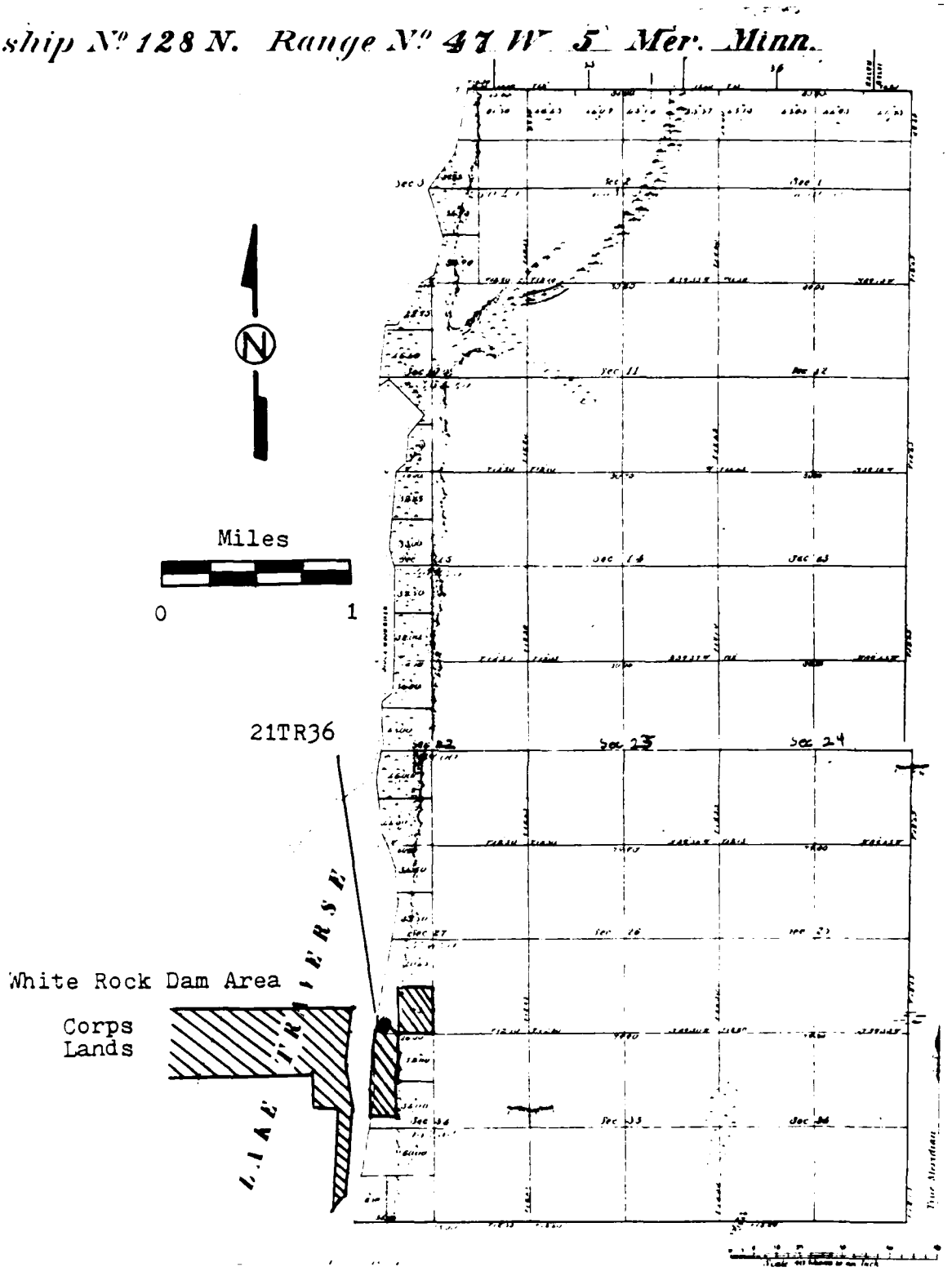


Figure 34. Government Land Office map of Minnesota, ca. 1871. T128N, R47W.

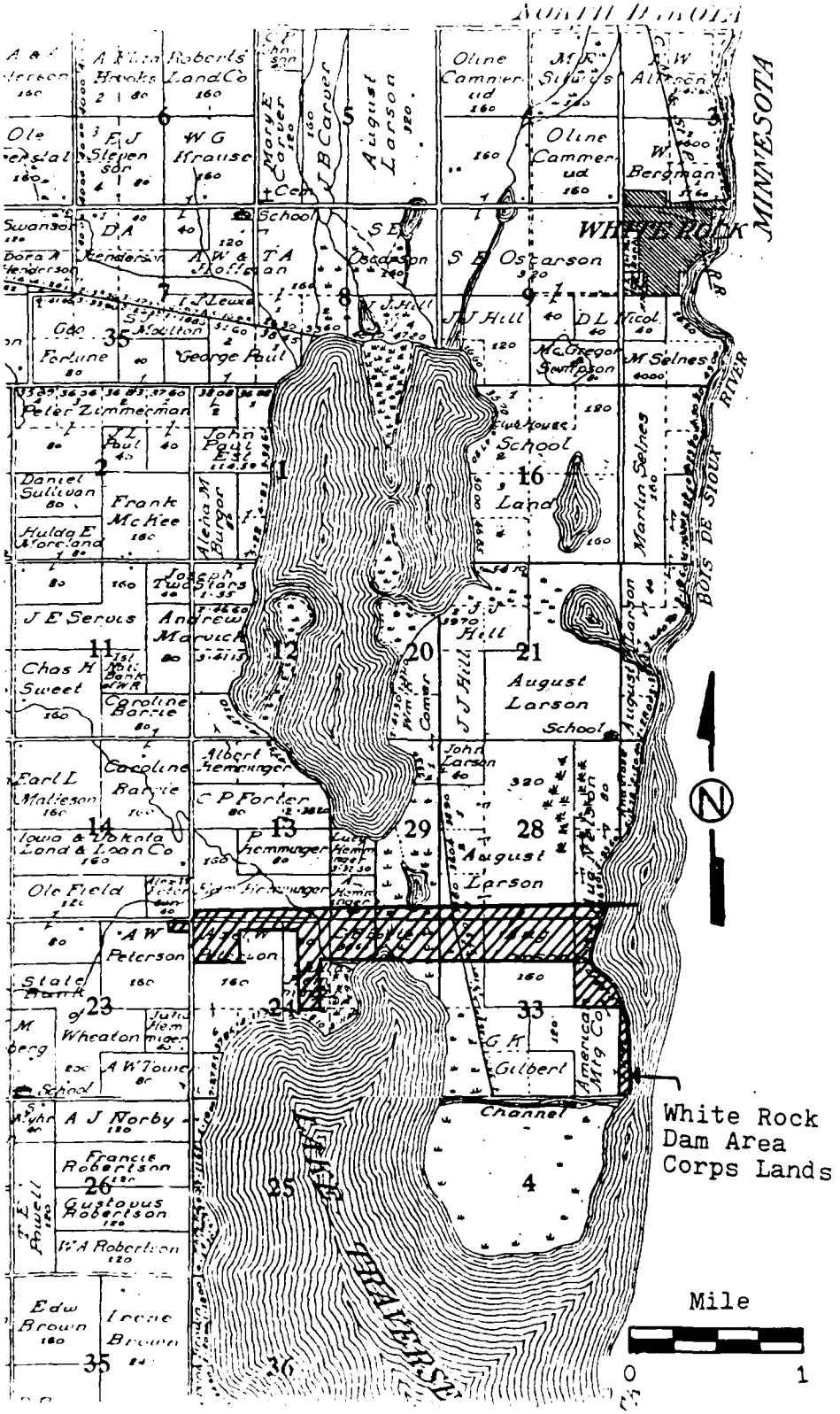


Figure 35. Roberts County atlas map of White Rock Township, ca. 1910.

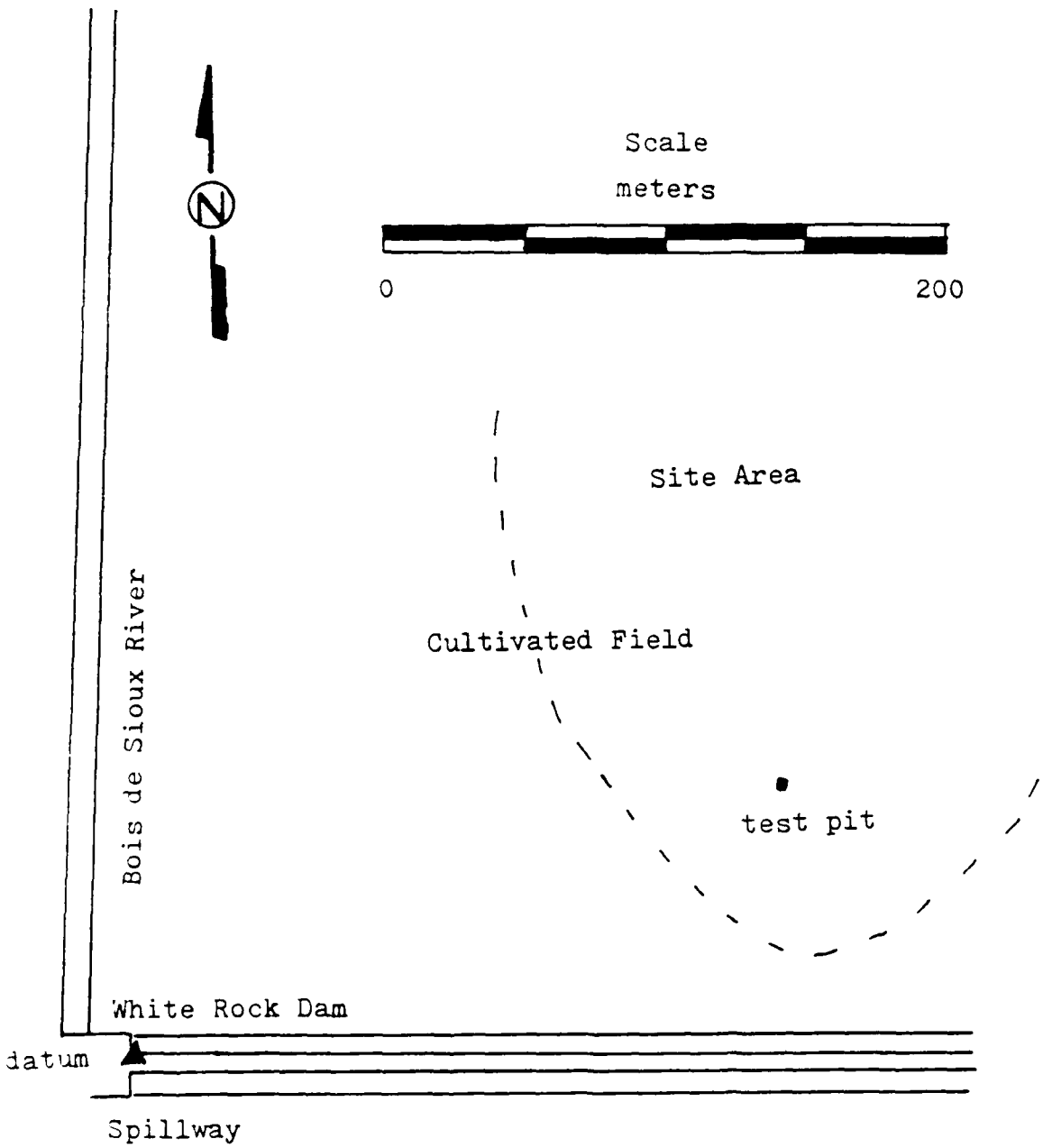


Figure 36. Excavation map of site 21TR36.

a

b

Figure 37. a. Photograph of site 21TR36, looking north.
b. Photograph of test pit at site 21TR36.

that a deep test pit was not required, since cultural remains would have to be on or near the surface of the ground. No artifacts were recovered from the test pit.

PREHISTORIC ARTIFACTS

Provenience and Artifact Type	Quantity	Material Type	Remarks
Surface:			
Projectile Point	1 frag.	chert	base
Flakes	7	chert	-
Shatter	3	chert	-

FAUNAL REMAINS

Provenience and Taxon	Element	No.	Side	Condition	Remarks
Surface:					
Bison/Bos-size	humerus	1	left	disto-anterior shaft	-
Unidentified	bone	4	-	fragments	-
Freshwater Mussel	shell	1	-	fragment	-

Recommendations

Site 21TR36 consists of a very thin surface scatter of lithics and bone fragments. No culturally/temporally diagnostic artifacts were recovered. The presence of glacial till over the entire surface of the site and its geologic location, in addition to results of the test excavation, indicate the possibility for buried cultural components and/or remains is very slight. The prehistoric cultural component has definitely been greatly disturbed by cultivation activities. It is recommended that the site is not potentially significant and does not warrant further investigation. The site is presently being used as a food plot for wildlife and, because of past cultivation activities and erosion, is not in any danger of being further destroyed. If future land alterations other than cultivation are planned for the site area, it is recommended that no further investigations are warranted.

CHAPTER 6
Settlement Patterns
and
Phase II Testing and Phase III Preservation/Mitigation

Introduction

An examination of sites with respect to soil associations, as defined by the Soil Conservation Service, is an informative method for developing predictive models for site locations. Unfortunately, Traverse County has not been completely mapped by the Soil Conservation Service. In contrast, the soils of Roberts County have been mapped. There are 40 recorded archaeological sites, including those sites found during this study, in Traverse County. The 40 sites are represented by 27 sites with mounds, two burial sites, one circular ditch site, eight lithic scatters, one village, and one undetermined site (21TR34)(Table 12).

The Browns Valley Man site (21TR5) is the only site that has been nominated to the National Register. It is not on the National Register because it has subsequently been destroyed by operations at the gravel quarry. Most all of the sites recorded in Traverse County (particularly the mounds) are located on high bluff and ridge tops with prominent views of Lake Traverse and/or stream valleys. There has not been a systematic survey conducted for Traverse County that would provide a less biased sample of site locations. Therefore, the present data do not lend themselves to the development of a meaningful settlement pattern study for sites in Traverse County, other than the fact that mounds are located on prominent ridge and bluff tops near Lake Traverse and/or stream valleys.

There are 44 recorded sites, including those sites found during this study, in Roberts County. The 44 sites are represented by 15 with mounds, eight lithic scatters, two fortified villages. five log cabins and/or fur trading posts, four petroglyphs, one stone circle, one stone alignment, three farmsteads, three burials (other than mounds), one stone cairn, and one undetermined site. Table 13 shows the sites and their soil associations for Roberts County. Most of the sites occur on bluff or ridge tops overlooking lakes Big Stone and Traverse.

The present study recorded three new sites (39RO44, 21TR36, and 39RO45/21TR35) that represent Late Woodland and historic occupations. The reasons for this seemingly low occurrence of sites are due to the locations of the survey areas. The lands surveyed during the present project included three areas, all of which are located on low-lying lands or very steep slopes adjacent to Corps dams and dikes that were constructed during the past half century. Because of the construction of these water control structures, areas immediately adjacent to the dams and dikes were stripped, destroying any evidence of cultural remains. Also,

Table 12

Traverse County Sites and Site Types

Site	Site Type and Name
21TR1	Round Mound
21TR2	Wilson Mounds
21TR3	K-Mounds
21TR4	Fire Mound
21TR5	Browns Valley Man (burial site)
21TR6	Shady Dell Mounds
21TR9	Strader Burial
21TR10	5 mounds
21TR11	Bunker Hill Mounds
21TR12	1 mound
21TR13	1 mound
21TR14	Circular ditch
21TR15	1 mound
21TR16	3 mounds
21TR17	5 mounds
21TR18	3 mounds
21TR19	1 mound
21TR20	1 mound
21TR21	1 mound
21TR22	1 mound
21TR23	1 mound
21TR24	1 mound
21TR25	1 mound
21TR26	1 mound
21TR27	Smith Mounds
21TR28	Mustinka River Mounds
21TR29	2 mounds
21TR30	Strader Village
21TR31	1 mound (same as 21TR9)
21TR32	3 mounds, ditch
21TR33	1 mound
21TR34	?
21TR35	lithic scatter
21TR36	lithic scatter

Dome Pipeline Report
Sites 1 to 6, all lithic scatters

Table 13

Roberts County Sites, Types, Names and Soil Associations

Site	Site Type, Name	Soil Type
39RO1	Dougherty Mounds	?
39RO2	Griner Mounds	HvA
39RO3	Buchannan Mounds	HvB
39RO4	Hartford Beach Mound	HvB
39RO5	Hartford Beach Village	HvB (fortified)
39RO6	Hiawatha Beach Mounds	HvB
39RO7	Hunter's Mound	HvB
39RO8	Linden Beach Mound	HvA
39RO9	Mound	?
39RO10	Dougherty Mounds	HvA
39RO11	Medberry Mound	HcA
39RO12	Moorehead Mound	PeA
39RO13	Lithic scatter	HvB
39RO14	Log Cabin	SsF
39RO15	Lithic scatter	?
39RO16	Lithic scatter	?
39RO17	?	?
39RO18	Burial	?
39RO19	Lithic scatter	?
39RO20	Lithic scatter	?
39RO21	Log Cabin, Fur Post	FeB
39RO22	Lithic scatter	HcB
39RO23	DeSpiegler Burial	ReB
39RO24	Fur Post	?
39RO25	Petroglyph	?
39RO26	Sisseton Mound	PeB
39RO27	Burial	HvB
39RO28	Farmstead	SsF
39RO29	Mound	HvB
39RO30	Lightening Track, Cairn	HsB
39RO31	Petroglyph	?
39RO32	Petroglyph	?
39RO33	Petroglyph	?
39RO34	Trapper's Cabin	FeB
39RO35	Farmstead, Rudolph Moody	FeB
39RO37	Gabriel Renville Mound	FeB
39RO38	Trading Post	FvE
39RO39	Lithic scatter	HvB
39RO40	Stone Circle	RsE
39RO41	Stone Alignment	RsE
39RO42	Village, fortified	FuE
39RO301	Kallstrom Mound	?
39RO44	Farmstead, Karsbrek	GyA
39RO45	Lithic scatter	La, Pm

examination of the General Land Office (GLO) survey maps (ca. 1870, 1909) and Roberts and Traverse counties' atlases (ca. 1902, 1910)(Figs. 23, 24, 25, 30, 34, 35) indicate a large portion of Corps lands were originally inundated and/or were wetlands prior to construction of the water control structures. Examination of the soil survey of Roberts County (Miller, Koopman, and Glover 1977) confirms the (Table 14) susceptibility of Corps lands to frequent flooding and high water tables that make these areas very unsuitable for human habitation. The grasslands and woodlands on Corps property are in these areas of high susceptibility to inundation. The geomorphic history of these low lying lands makes them the least likely to have been utilized as habitation sites. Therefore, the low frequency of cultural resources occurring on Corps lands is not unusual. The more suitable areas around Lake Traverse and Mud Lake for human habitation are situated on better drained soils that are not as susceptible to a high water table and inundation. The following are brief descriptions of the 13 soil types that have known archaeological sites located on them in Roberts County and five additional soil types that occur on Corps lands but which do not have archaeological sites associated with them (from Miller, Koopman, and Glover 1977).

Ac, Antler-Colvin silt loams, 0 to 2 percent slopes

The Antler-Colvin soil complex occurs on flat areas with many shallow depressions. Antler soils are on the slight rises and Colvin soils are in the shallow depressions. In places numerous stones are on the surface. About 50 percent of this complex is Antler soils and 30 percent is Colvin soils. These soils are wet during much of the spring and summer. Native vegetation is grass.

AvA, Antler and Hamerly loam, 0 to 2 percent slopes

The Antler and Hamerly soils are on slightly higher ground, but the water table is within one meter (four feet) of the surface during most of the growing season. Native vegetation is grass.

Bo, Borup silt loam, 0 to 2 percent slopes

Borup silt loam is in flats, swales and shallow depressions. Soils are susceptible to wetness because of a high water table. Native vegetation is grass.

Co, Colvin silt loam, saline, 0 to 2 percent slopes

Colvin silt loam occurs in closed depressions on low flatlands. Stones and boulders oftentimes occur on the surface. The water table is high during the spring and summer causing wetness. Native vegetation is grass.

Mr, Marsh, 0 to 1 percent slopes

Marsh is a land type (as opposed to a soil type) that is in level, closed depressions that are wet throughout the spring and summer and in some years are inundated much of the time.

Pa, Parnell silty clay loam, 0 to 1 percent slopes

Parnell silty clay loam occurs in closed depressions that oftentimes have a thin layer of mucky, partly decomposed organic matter on the surface. These soils are commonly inundated in the spring.

FeB Fordville-Renshaw loams, 3 to 6 percent slopes

The Fordville-Renshaw loams are on stream terraces and uplands. About 70 percent of this complex is Fordville soils and 25 percent is Renshaw soils. These soils are droughty, with low water capacity. Runoff is medium. The native vegetation consists of mid and short grasses.

FuE, Forman-Buse loams, 15 to 25 percent slopes

Forman-Buse loams are soils on hilly uplands. The Forman soils are on sides of ridges and knolls, and the Buse soils are on the tops and upper portions of ridge slopes. A few stones commonly occur on the surface. Many small potholes dot the landscape. About 45 percent of this complex are Forman soils, and 25 percent are Buse soils. The native vegetation is grass.

FvE, Forman-Buse stony complex, 9 to 40 percent slopes

This complex of rolling to steep soils is on uplands. The stony parts of this complex are in the higher parts of the landscape. The stones are spaced about 2.5 to 5 feet apart on the surface. About 55 percent of this complex is Forman loam and 20 percent is Buse stony loam. Runoff is medium to rapid. Native vegetation is grass.

GyA, Glyndon silt loam, 0 to 3 percent slopes

The Glyndon series consists of deep, moderately well-drained and poorly drained, nearly level soils. These soils formed in lacustrine silt and very fine sand. Native vegetation consists of tall prairie grasses.

HcA, HcB, Hammerly-Vallers loams,
0 to 2, 2 to 4 percent slopes

The soils of this complex are mostly in areas around depressions and sloughs on uplands. Some areas border bottom lands. A few stones are on the surface in some areas. About 65 percent of this complex are Hammerly soils and 20 percent are Vallers soils. This complex has a high lime content and is very wet in the spring.

HsB, Heimdal-Sisseton loams, 2 to 6 percent slopes

This complex consists of gently undulating soils on uplands. The Heimdal soils are on the sides of knolls and the Sisseton soils are on knolls and ridge tops. A few stones occur on the surface. About 55 percent of this complex are Heimdal soils and 20 percent are Sisseton soils.

HvA, HvB, Heimdal-Svea loam, 0 to 2, 2 to 6 percent slopes

This complex consists of gently undulating soils on up-

lands. The Heimdal soils are on slight rises and the Svea soils are in swales. About 75 percent of this complex are Heimdal soils and 15 percent are Svea soils. Runoff is slow with temporary wetness in the Svea soils.

La, LaDelle silt loam

The LaDelle series consists of deep, moderately well-drained, nearly level, silty soils on bottom lands and low terraces. These soils formed in alluvium. The native vegetation is tall prairie grass.

PeA, PeB, Peever clay loam, 0 to 2, 2 to 6 percent slopes

The Peever series consists of deep, well-drained, nearly level to sloping, loamy soils on uplands. These soils formed in glacial till. Permeability is slow, runoff is slow or medium. The native vegetation consists of tall and mid prairie grasses.

Pm, Playmoor silty clay loam

The Playmoor series consists of deep, poorly drained, nearly level, calcareous, silty soils that contain salt at or near the surface. These soils formed in alluvium and are on bottom lands. Permeability is moderately slow and runoff is slow. The seasonal water table is at or near the surface during spring and is within one meter (three feet) during most of the growing season. The soils are subject to flooding. The native vegetation is tall grass.

ReB, Renshaw loam, 0 to 3, 3 to 9 percent slopes

This soil is on the uplands and terraces. Gravel and cobbles are scattered on the surface. This soil is droughty. Runoff is slow and available water capacity is low. The soils are shallow over sand and gravel. They formed in alluvium. The native vegetation consists of mid and short grasses.

RsE, Renshaw-Sioux stony loams, 9 to 40 percent slopes

This complex consists of rolling to steep soils on gravelly ridges or glacial moraines on uplands. Renshaw soils are on the sides of ridges and Sioux soils are on the tops and upper sides of ridges. The stones are about 2.5 to 5 feet apart. A few large boulders are present. About 50 percent of this complex are Renshaw soils and 35 percent are Sioux soils. The native vegetation is grass.

SsF, Sisseton loam, 25 to 40 percent slopes

The Sisseton series consists of deep, well-drained, gently undulating to steep, calcareous, loamy soils on uplands. These soils formed in glacial drift. Permeability is moderate and runoff is medium or rapid. The native vegetation consists of mid and short grasses.

Examination of Table 15 shows some associations between site types and soil types in Roberts County. Several sites, because of the lack of more specific site location information, cannot be placed within any specific soil complex.

Also, because there has not been a systematic survey of Roberts County, known site locations are biased. However, given the available information, the following summaries are provided.

(1) Prehistoric mound sites are located on the uplands, on ridge tops that have predominately Heimdal-Svea (HvA, HvB) and Peever (PeA, PeB) soil complexes.

(2) Prehistoric habitation sites (lithic scatters) are most frequently found on the uplands with the Heimdal-Svea soil complex (HvA, HvB) or on the low bottom lands with the LaDelle (La) soil complex that is associated with low terraces adjacent to bodies of water.

(3) Prehistoric stone circles and stone alignments occur most frequently on the rolling uplands with the Renshaw-Sioux (RsE) soil complex.

(4) Historic sites are associated with a variety of topographic situations and soil complexes.

The following is a synthesis of the available geomorphological, archaeological, and pedological data for the area around Lake Traverse, and for Corps lands in particular. First, the project area is situated on the bed of the former channel of Glacial River Warren, which served as the southern outlet for Lake Agassiz during the waning stages of the Late Wisconsin glaciation until about 7,200 B.C. (Wright 1972). The glacial and related landforms have been little altered since 7,000 B.C. After termination of River Warren, its successor, the Minnesota River did not have the discharge necessary to transport the sediment load produced by tributary streams. The tributaries formed alluvial fans near their confluence with the Minnesota River. The alluvial fans dammed the river into segments which created several narrow lakes of which Lake Traverse is one. The formation of the alluvial fans created a very unstable land surface between the lakes, making the alluvial fans not very suitable for human occupation because of their susceptibility to inundation. Almost all of the Corps lands at Lake Traverse and Mud Lake are on these alluvial fans.

The Corps dams constructed in 1939 to 1941 were to help stabilize the fluctuating water level of Lake Traverse. Almost all of the soil types that are associated with the Corps lands (Table 14) have formed in recent alluvium and are susceptible to frequent high water tables and/or inundation. Examination of the General Land Office (GLO) maps (ca. 1870, 1902)(Figs. 23, 30, 34) and early county atlases (ca. 1902, 1910)(Figs. 24, 25, 35) support the geomorphic and soil evidence that Corps lands were very unstable land surfaces, particularly prior to construction of the water control structures. Unstable land surfaces that are very susceptible to wetness and inundation are not the areas most likely to

Table 14

Corps Lands in Roberts County and Associated Soil Types

White Rock Dam Area

Soil

Ac, Antler-Colvin silt loams
AvA, Antler and Hamerly loam, 0 to 2 percent slopes
Co, Colvin silt loam, saline
GyA, Glyndon silt loam, 0 to 3 percent slopes
Mr, Marsh (vegetation type, not soil type)
Pm, Playmoor silty clay loam

Reservation Dam Area

Bo, Borup silt loam
GyA, Glyndon silt loam, 0 to 3 percent slopes
Mr, Marsh (vegetation type, not soil type)
Pm, Playmoor silty clay loam

Browns Valley Dike Area

HcB, Hamerly - Vallers loam, 2 to 4 percent slopes
Mr, Marsh (vegetation type, not soil type)
Pa, Parnell silty clay loam
Pm, Playmoor silty clay loam
SsF, Sisseton loam, 25 to 40 percent slopes

All of the above soils are very susceptible to high water tables, inundation, or wetness except for SsF which occurs on very steep slopes.

Table 15

Site Types and Associated Soil Complexes, Roberts County

mounds	soil	village	soil	burials	soil	petro-glyphs	soil
39R01	?	39R05	HvB	39R018	?	39R025	?
39R02	HvA	39R013	HvB	39R023	ReB	39R031	?
39R03	HvB	39R015	La	39R027	HvB	39R032	?
39R04	HvB	39R016	?			39R033	?
39R06	HvB	39R019	?				
39R07	HvB	39R020	?				
39R08	HvA	39R022	HcB				
39R09	?	39R039	HvB				
39R010	HvA	39R042	FuE				
39R011	HcA	39R045	La,Pm				
39R012	PeA						
39R026	PeB						
39R029	HvB						
39R037	FeB						
39R0301	?						

log_cabins	soil	farmsteads	soil	cairns	soil
39R014	SsF	39R028	SsF	39R030	HsB
39R021	FeB	39R035	FeB		
39R024	?	39R044	GyA		
39R034	FeB				
39R038	FvE				

Stone Alignments	soil	Undetermined	soil
39R040	RsE	39R017	?
39R041	RsE		

have been utilized by prehistoric peoples for habitation sites.

The prehistoric site 39RO45/21TR35 is located on a low terrace that is slightly higher than adjacent lands along the headwaters of Lake Traverse. Because this location is highly susceptible to unundation during the spring and summer, the most suitable time for occupation would have been during the winter months. The steep bluffs on both sides of the site would have provided protection from winter storms. Because of the very unstable land surface, deeply buried cultural remains are not likely.

Site 21TR36 is situated on a higher terrace that has been subjected to erosion because of the occurrence of a relatively dense scatter of glacial till on the surface and below the surface. Since the glacial till would have been deposited by Glacial River Warren, the till deposits may be relatively dated no later than 7,000 B.C. and because there is no soil development on top of the glacial till, this indicates either subsequent alluviation never occurred or it did occur but erosion has stripped it off of the earlier deposited till. In either case, in situ subsurface cultural remains are very unlikely at this site location.

Given this geomorphological data, Paleo-Indian and Archaic remains can not be present on the low lying Corps lands at the Lake Traverse-Bois de Sioux project, since Glacial River Warren flowed through the valley until 7,200 B.C. and the alluvial fans that have created the long narrow lakes in the region are very unstable surfaces not conducive to human occupation until fairly recent times (i.e., Woodland period), and then only suitable for occupation on a seasonal basis (i.e., winter months). Paleo-Indian and Archaic sites can be expected to occur in the region, but they will be located on the higher beaches of Glacial Lake Agassiz or on the bluff tops and ridges overlooking Lake Traverse.

On the basis of the above associations between site types, geomorphic data and defined soil complexes, the following hypotheses are proposed. These hypotheses are developed for the purpose of guiding future archaeological research in Roberts County, South Dakota and Traverse County, Minnesota. Because of the limited topographical areas surveyed during the present study, these hypotheses could not be tested.

Hypothesis 1

Prehistoric mounds occur on prominent ridge tops that have the Heimdal-Svea and Peever soil complexes. The mounds may be associated with Plains Woodland and later prehistoric and historic peoples. The mounds were also used as burial sites by at least the resident Dakota population of the 18th, 19th and 20th centuries (Sigstad and Sigstad 1973b:28).

Hypothesis 2

Prehistoric and historic Indian villages are located on both upland and bottom land topographic situations. The upland villages are most likely to be associated with summer occupations while the bottom land villages are most likely to be associated with winter occupations. The bottom land sites may occur on soils that are subject to periodic, seasonal flooding, which would have made them unsuitable for spring and summer occupation. The upland villages are located on prominent ridge tops that would have been subject to severe winter storms which would have made them unsuitable for winter occupations.

Hypothesis 3

Prehistoric fortified villages associated with the Initial Middle Missouri variant of the Middle Missouri Tradition are present in the region. These villages are small, encompassing less than 0.5 hectares (one acre), and have fortification ditches. The villages are situated on the points of prominent ridge tops, with the fortification ditch across one side of the ridge. The natural steep sides of the ridge provided protection on three sides. The fortification of the small villages suggests conflict between these village dwelling peoples and other regional inhabitants. These hostilities may have been attributed to a shortage of food resources due to climatic stress (Pacific I climatic episode, A.D. 1250 to 1450) consisting of more droughty conditions which would not have been as conducive to maize horticulture.

Hypothesis 4

Historic sites, consisting of fur trading posts, trappers' cabins, and early farmsteads, were constructed in a variety of topographic locations. The early farmsteads tend to be located adjacent to a primary water source such as a river or lake. These locations were suitable for protection from harsh winter winds but were probably unsuitable during severely wet weather.

Few sites have been recorded on the uplands between lakes Traverse and Big Stone and the Coteau des Prairies. This leads to very biased interpretations regarding prehistoric and historic occupation of the region. More inventory surveys need to be conducted away from major lakes and rivers in order to develop a more reliable and accurate interpretation of the region's prehistory.

Summary

Reconstructing past cultural complexes and understanding how peoples lived within the area of Lake Traverse is a complex task. The recovery of a miniscule amount of cultural remains did not allow any broad analysis of the artifactual data. However, examination of recorded sites in Roberts County and their corresponding soil associations allows correlations to be made with respect to site types and topographic features and soil complexes. Some initial hypotheses con-

cerning site locational behavior by prehistoric inhabitants can be expanded upon in the next phase of research.

Phase II Testing and Phase III Preservation/Mitigation

Introduction

The Lake Traverse-Bois de Sioux project presently has few adverse impacts upon cultural resources within lands held in fee title by the Corps of Engineers. Therefore, at the present time, continued avoidance of the two sites believed to be potentially significant (39RO44 and 39RO45/21TR35) is recommended. Avoidance of any land alterations in the vicinity of these two sites will maintain their present integrity. However, if future land alteration activities are planned for the above two site areas, and avoidance is not a reasonable alternative, then the following two approaches to mitigating the adverse impacts on these two sites are recommended. The two approaches are: (1) test excavation and (2) contiguous excavation.

Test excavation is defined as the systematic, manual digging of small portions of a site to determine its scientific significance and eligibility for nomination to the National Register. If a site is determined to be significant and is nominated to the National Register, then contiguous excavation may be warranted if avoidance is not possible. Contiguous excavation is defined as the excavation of contiguous 1 x 1 meter pits to obtain detailed understanding of the architecture, function, and time of use or habitation of a site. This is maximum data recovery in order to acquire as much information from a site as possible prior to its destruction by other land alterations.

Phase II Testing

Two sites, 39RO44 and 39RO45/21TR35, are recommended for this plan. It is recommended that test excavations at site 39RO45/21TR35 consist of 1 x 1 and 1 x 2 meter pits placed over the site area located on Corps lands. Prior to excavation of the test pits, it may be best to shallowly plow the site area to obtain maximum surface visibility. Because portions of the site located on Corps lands have been cultivated for wildlife food plots, further plowing should not adversely affect the cultural remains. After plowing, a cartesian coordinate grid can be superimposed over the site and a controlled, gridded surface collection can be conducted. Grid sizes of 5 x 5 or 10 x 10 meters may be most appropriate. Based upon the surface densities of artifacts within each grid unit, test pits can be placed in those areas believed to most likely yield subsurface remains.

A substantial amount of information can be obtained about a site by conducting controlled, gridded surface collections. Because the geomorphic processes that have operated upon the site make the presence of deeply buried cultural remains unlikely and deep test pits unnecessary, the

plowing and controlled, gridded surface collection will increase the probability of placing the test pits in areas most likely to have subsurface remains. A single back-hoe trench may be placed on the site to examine more deeply buried soils for the presence of geomorphic anomolies. All soils from the test pits should be dry or water screened through hardware cloth and soil samples should be taken for water flotation for recovery of microfloral and microfaunal data. It is estimated 20 person-days may be required to test the site. Approximately 50 person-days may be required for analysis and report writing. Therefore, it is estimated about $ 7,000 may be required to conduct test excavations at site 39RO45/21TR35.

For site 39RO44, it is recommended that it be sufficiently tested to determine the form of construction of past structures, time of habitation or use, and function. Test excavations should minimally consist of a one meter wide trench through the center of the mound where the house may have been. Additional 1 x 1 and 1 x 2 meter pits may be excavated in a random pattern in areas around the mound to determine the presence of other structures. All soils should be sifted through hardware cloth and soil samples saved for water flotation for recovery of microfloral and microfaunal data. It is estimated 20 person-days may be required to test the site. Approximately 50 person-days may be required for analysis and report writing. Therefore, it is estimated $ 7,000 may be required to conduct test excavations at site 39RO44.

Phase III Preservation/Contiguous Excavation

Contiguous excavation is recommended for those sites that are determined to be scientifically significant and eligible for nomination to the National Register after Phase II testing. Based upon the findings of the Phase II test excavations, the following generalized outline for field procedures is given for each of the above two sites if avoidance procedures can not be taken.

For site 39RO44, contiguous excavation of the entire mound is recommended. Excavation units consisting of contiguous 1 x 1 meter pits dug to a depth determined to be the base of the historic occupation are recommended. All soils should be sifted through hardware cloth. Soil samples should be taken for water flotation to recover microfaunal and microfloral data. Because the earthen mound is approximately one meter high, and ten meters in diameter, the excavation pits near the center of the mound will likely be at least one meter deep. It is recommended that the field director be an experienced historical archaeologist. It is estimated 100 person-days may be required to excavate the mound and 250 person-days may be required for analysis and report writing. Therefore, it is estimated $25,000 may be required to completely excavate the earthen mound at site 39RO44.

For site 39RO45/21TR35 contiguous excavations may best

be conducted after the removal (stripping) of the plowzone from most of the site area that is on Corps land. Plowzone removal may best be done with the use of mechanized power equipment such as graders and/or paddle-wheel scrapers. Removal of the plowzone will facilitate excavation of in situ artifacts and features. All features, (i.e., hearths, storage pits, post molds, structures, etc.) should be mapped and excavated after removal of the plowzone. It is recommended that all feature contents should be processed by water flotation to recover microfloral and microfaunal data. It is recommended that areas immediately surrounding features be excavated to a distance of several meters. Recent research indicates many activities were performed around the peripheral areas of features as opposed to the features themselves (Binford 1978). The excavation procedures outlined above are designed to maximize data recovery and interpretation potential of site data. Because of the size of the site and present lack of information regarding the quantity and types of subsurface features that may be present at the site, no reliable cost estimates can be made.

Summary

The Phase II testing and Phase III contiguous excavation of prehistoric and historic cultural resources within the Lake Traverse-Bois de Sioux project may require a substantial amount of time if sites 39RO44 and/or 39RO45/21TR35 are subjected to disturbance by land alterations. All cost estimates are in 1983 dollars. However, neither of the above sites on Corps lands are in immediate danger. Present day adverse impacts are minimal. Continued avoidance of adverse impacts upon these two sites is recommended as the best alternative to preserving their present integrity.

National Register of Historic Places

The Antiquities Act of 1906 (Public Law 59-209) was the first legislation enacted by Congress for the protection of historic and prehistoric archaeological sites situated on lands owned or controlled by the United States Government. The Historic Sites Act of 1935 (Public Law 74-292) was enacted "to preserve for public use historic sites, buildings and objects of national significance for the inspiration and benefit of the people of the United States." The National Historic Preservation Act of 1966 (Public Law 89-665) created the National Register of Historic Places as a list of properties "significant in American history, architecture, archaeology, and culture" (Sec. 101 (a)(1)). Criteria for evaluation and determination of eligibility for nomination to the National Register of Historic Places are set forth in 36 CFR 800.10(a):

> The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of State and local importance that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and
>
> (a) That are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> (b) That are associated with the lives of persons significant in our past; or
>
> (c) That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
>
> (d) That have yielded, or may be likely to yield, information important in prehistory or history.

The National Environmental Policy Act (NEPA) of 1969 (Public Law 91-190) requires federal agencies to consider the environmental impacts of planned projects. As a result, since cultural resources are parts of the environment, federal agencies are required to identify and plan for the protection of cultural resources, both prehistoric and historic, during their project-planning and land management programs. Executive Order 11593 requires federal agencies to identify historic properties under their control or jurisdiction that might qualify for the National Register. The Archaeological and Historic Preservation Act of 1974 (Public Law 93-291)

specifically provides for the preservation of archaeological and historical data "which might otherwise be irreparably lost or destroyed" as the result of federally constructed dams or as the result of any federally funded or assisted construction project, activity, or program.

Archaeological Research and Determination of Site Significance

In accordance with the aforementioned cultural resource management regulations, federal agencies are required to determine the National Register eligibility of archaeological resources under their control. This is accomplished by assessing information and recommendations provided by archaeologists. Raab and Klinger (1977:632) suggest that "the best approach to assessing archaeological significance is in relation to explicit, problem-oriented research designs". Sharrock and Grayson (1979:327) agree that although significance determined in this way is "an excellent reason to ascribe significance in the National Register sense," the converse may not necessarily be true. In other words, just because an archaeological resource is found to be insignificant in terms of a current problem-oriented research design, it does not necessarily follow that the site is, in fact, insignificant. "The 'significance' of a site is clearly subject to change through time, increasing or decreasing as both knowledge and research orientation change" (Sharrock and Grayson 1979:327). This potential problem is anticipated in the National Register criteria. Archaeological resources are significant when they "have yielded, or may be likely to yield, information important in prehistory or history" (36 CFR 800.10). As a result, federal agencies bear the burden of proving that sites within their domain are neither significant nor potentially significant. As stated earlier, this is accomplished by acting upon information and recommendations provided by the contracting archaeologist. "The importance of the contracting archaeologist's assessments of significance cannot be overemphasized" (Klinger and Raab 1980:556).

Once a site has been determined not be be significant, it is excluded from further federally funded research and does not receive protective management consideration. Therefore, it is important that the potential significance of an archaeological resource be carefully considered. The full archaeological potential of a site may be difficult to realize if its significance is poorly documented.

Survey Results and Recommendations

Three sites were found on lands held in fee title by the U.S. Army Corps of Engineers. Two sites, 39RO45/21TR35 and 21TR36, have prehistoric components and one site, 39RO44, has an early 20th century Euro-American occupation. A test excavation indicated the presence of subsurface historic artifacts at site 39RO44. It is recommended that the site is potentially significant. The site is not presently endangered by the project and future avoidance is recommended. If future

land alterations are planned, then it is recommended that extensive test excavations be conducted in order to determine its eligibility for nomination to the National Register. The site location is not conducive to the presence of buried prehistoric components because of the geologic history and geomorphic processes operating at the site.

Site 39RO45/21TR35 has a very large Late Woodland occupation. Test excavations indicate subsurface cultural remains are present. A literature and records search indicates portions of the site located on private lands may be associated with Standing Buffalo's Village (ca. early 1800's to 1860's). However, ceramics recovered from the portion of the site adjacent to Corps lands indicates an earlier, Late Woodland occupation in this area of the site. The site potentially contains significant scientific data that may help elucidate the prehistory of the region. The site location is not conducive to having buried cultural components because of the location's geologic history and geomorphic processes.

Site 21TR36 consists of a very thin lithic and bone scatter on the surface. Test excavations indicate surface erosion has occurred on the site. The presence of glacial till over the entire site surface and in subsurface tests indicate the presence of buried cultural remains is unlikely. No subsurface cultural remains were recovered. It is recommended that the site is not significant and does not warrant further investigation. The site is not presently endangered by the project.

In summary, two of the three sites found during the project are considered potentially significant. One site, 21TR36, is considered destroyed by cultivation and erosion. Portions of the historic site, 39RO44, are periodically inundated by impounded waters in Mud Lake. The prehistoric occupation at site 39RO45/21TR35 is not in any immediate danger from adverse impacts. However, the site should be avoided by any future land alteration and avoidance is the best recommendation.

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APPENDIX A

Site Forms

MINNESOTA ARCHAEOLOGICAL SITE FORM

COUNTY	SITE NAME	FIELD NUMBER	STATE NUMBER
Traverse MN Roberts, S.D.		1	TR-35

OWNER
U.S. Army Corps of Engineers,

U.S.G.S. QUAD
Browns Valley Quad

SITE LOCATION
SE¼ Section 29 Traverse County
NE¼ SE¼ SW¼ Section 29 Traverse County
S½ NE¼ SW¼ Section 29 Traverse County
NE¼ NE¼ Section 32 Traverse County
W½ NE¼ Section 31 Roberts County
S½ NW¼ Section 31 Roberts County
E½ Section 30 Roberts County

LEGAL DESCRIPTION
T 125N R. 49W twnspEaster. I

SITE TYPE
Prehistoric, village

PROBABLE CULTURAL COMPONENTS:
Late Woodland, Oneota

SITE DESCRIPTION / ENVIRONMENTAL SETTING
The site is located on a terrace and lake bed of Lake Traverse, south of the South Dam. The site covers approximately 300 acres on both sides of the highway. The site has a very thin surface scatter of lithics and ceramics. Lithics include points, flakes, mauls, etc.

SITE CONDITION	CURRENT LAND USE	SITE AREA
Cultivated, grassland	Cultivated, wildlife area	300 acres

NATURE OF NEAREST WATER	DISTANCE TO WATER	DIRECTION OF SITE FROM
Lake Traverse	0 meters, adjacent to water	east and south

ELEVATION OF SITE: 970 to 980 feet MSL

ELEVATION OF NEAREST WATER: 970 feet MSL

NATURE, EXTENT OF INVESTIGATION: surface collection, one 1 x 1 meter test pit,

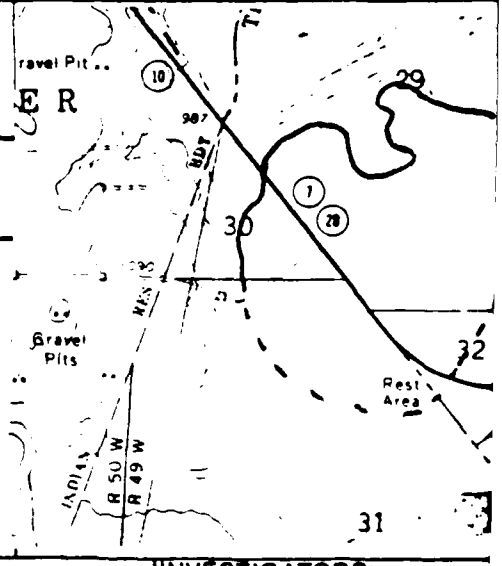
ARTIFACTS OBSERVED, RECOVERED:
shell tempered, cordmarked pottery sherds, small, unnotched triangular arrow points, grooved mauls, flakes, shatter, bone fragments (bison size, deer size)

LOCAL COLLECTIONS, INFORMANTS:
None

WRITTEN REFERENCES
None

COMMENTS:
The test pit (1 x 1 meter) indicates there is probably subsurface cultural remains, particularly features. Flecks of charcoal were observed below the plowzone which extends to a depth of 27 cm.

MAP SCALE: 7½ minute topo qua



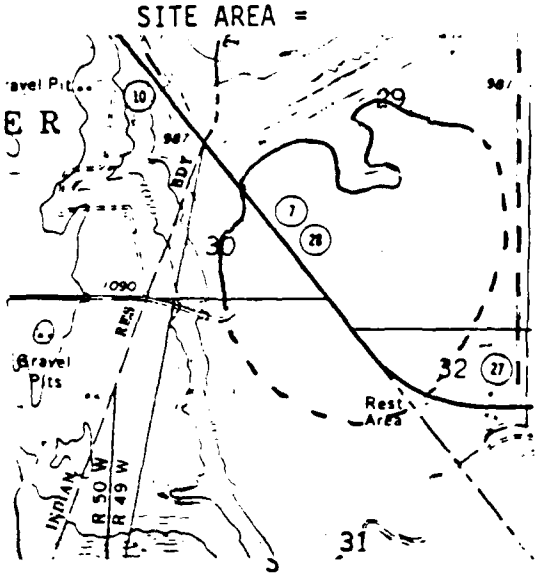
ACCESSION NOS.	PHOTO NOS.	REPOSITORY:	INVESTIGATORS:
		University of South Dakota Archaeology Laboratory	Kenneth and Marie Bro

PROJECT: Lake Traverse Surve DATE: Oct. 29, 1982

INFORMATION SUPPLIED BY Kenneth L. Brown DATE 11/10/82
ADDRESS USD, Archaeology Laboratory, Vermillion, S.D. 57069
RECOMMENDATIONS AND/OR COMMENTS
Site probably contains significant subsurface remains which may help elucidate the prehistoric occupation of the area by Lake Traverse. It is recommended that the site be nominated to the National Register of Historic Places

SITE NO. 39 R045
SEC T R
PHOTO COPY OF 7.5" QUADRANGLE
OR SKETCH MAP OF SITE

SITE AREA =



Legal Description, Cont.

NE¼ SE¼ SW¼ Section 29 Traverse County, MN
S½ NE¼ SW¼ Section 29 Traverse County, MN
NE¼ NE¼ Section 32 Traverse County, MN
W½ NE¼ Section 31 Roberts County, S.D.
E½ NW¼ Section 31 Roberts County, S.D.
E½ Section 30 Roberts County, S.D.

SITE NO. 39R045 NAME COUNTY Roberts
TYPE OF REMAINS (MOUND, VILLAGE, HABITATION, ETC.) village
CULTURAL AFFILIATIONS Late Woodland, Oneota
LOCATION SE¼ Sec. 29, Traverse County, MN SECTION 29 TOWNSHIP 125N RANGE 49W
ELEVATION 970-980 UTM COORDINATES center/ E667600 N5052000 MAP USED Browns Valley q
PROPERTY OWNER U.S. Army Corps of Engineers ADDRESS St. Paul, MN
DIRECTIONS TO SITE Site is 3/4 mile NW of Browns Valley, MN, south of dam of Lake Traverse, and is on both sides of highway 28 and 7. Site is west of highway 27.

NEAREST WATER: NAME Lake Traverse DISTANCE 0 meters DIRECTION north
TOPOGRAPHIC POSTION terrace, lake bed of Lake Traverse
SIZE IN METERS 900,000 square meters DEPTH OF SITE 35 cm
SUBSTRATE clay, silt
PRESENT VEGETATION grass, trees, cultivated crops GROUND SURFACE VISIBILITY (%) 100
CONDITION good
SURFACE COLLECTIONS? NO ___ YES XXX BY USD Archaeology Lab, Ken and Marie Brown DATE Oct 29,
EXCAVATIONS? NO ___ YES XXX BY USD, Ken and Marie Brown DATE ""
WHAT WAS FOUND flakes, ceramics, points, mauls, bone fragments
WHERE ARE COLLECTIONS USD, Archaeology Lab
ACCESSION NUMBER(S)
PUBLICATIONS CONCERNING SITE report to U.S. Army Corps of Engineers, St. Paul District

complete both sides and return to
SOUTH DAKOTA ARCHAEOLOGICAL RESEARCH CENTER. BOX 152. FORT MEADE, SOUTH DAKOTA 57741

MINNESOTA ARCHAEOLOGICAL SITE FORM

COUNTY	SITE NAME	FIELD NUMBER	STATE NUMBER
Traverse		2	TR-FS1

OWNER
U.S. Army Corps of Engineers

U.S.G.S. QUAD
Wheaton West Quad

SITE LOCATION
SW¼ SW¼ Section 27

LEGAL DESCRIPTION
T 128N R. 47W twnsp: Monson

SITE TYPE
Prehistoric, affiliation unknown

PROBABLE CULTURAL COMPONENTS:
unknown

SITE DESCRIPTION / ENVIRONMENTAL SETTING
Site is located on a slope and terrace of the Bois De Sioux River. The site is located north of highway 236, east of the gaging station for Mud Lake. The site is now cultivated for wildlife food plots.

SITE CONDITION	CURRENT LAND USE	SITE AREA
poor, cultivated	food plots etc for wildlife	30 acres

NATURE OF NEAREST WATER	DISTANCE TO WATER	DIRECTION OF SITE FROM
Bois De Sioux River	200 meters	east of river

ELEVATION OF SITE: 975 to 985 feet MSL

ELEVATION OF NEAREST WATER: 970 feet MSL

NATURE, EXTENT OF INVESTIGATION: surface collection, one 1 x 1 meter test pit

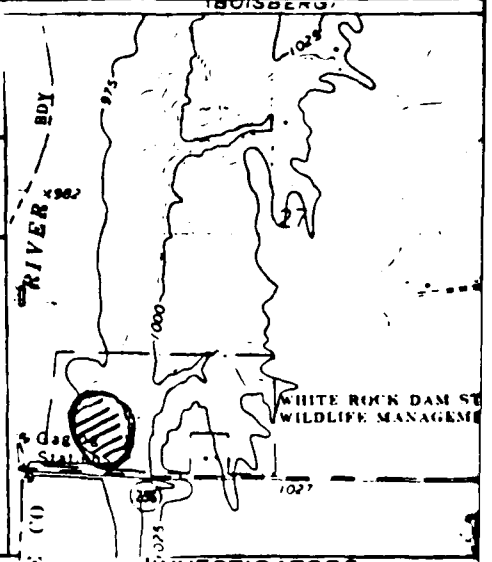
ARTIFACTS OBSERVED, RECOVERED:
flakes, broken projectile point fragment (arrow point?)

MAP SCALE: 7½ minute quad

LOCAL COLLECTIONS, INFORMANTS:
None

WRITTEN REFERENCES
None

COMMENTS:
The test pit indicates that the site has apparently been plowed out, ie all of the cultural material is within the plow zone, and there is little chance that there are subsurface features or artifacts which are in situ.



ACCESSION NOS.	PHOTO NOS.	REPOSITORY:	INVESTIGATORS:
		University of South Dakota	Kenneth and Marie B
		PROJECT: Lake Traverse Survey	DATE: October 31, 198

SITE NO 39R044 NAME COUNTY Roberts
TYPE OF REMAINS (MOUND, VILLAGE, HABITATION, ETC.) habitation (house)
CULTURAL AFFILIATIONS historic, post 1900
LOCATION W½ SW¼ SW¼ NW¼ SECTION 23 TOWNSHIP 127N RANGE 48W
ELEVATION 980 feet UTM COORDINATES E683100 N5069900 MAP USED Rosholt quad
PROPERTY OWNER U.S. Army Corps of Engineers ADDRESS St. Paul, MN
DIRECTIONS TO SITE site is on highway 117 at the west edge of Mud Lake, north of the road which separates Mud Lake from Traverse Lake. The site is ¼ mile west of roadside park on the road between the two lakes. A large cedar tree grows along the gravel section road, just north of the highway.
NEAREST WATER: NAME Mud Lake, Lake Traverse DISTANCE 100 meters DIRECTION sout
TOPOGRAPHIC POSTION on terrace and lake bed of Mud Lake
SIZE IN METERS 15 meters in diameter DEPTH OF SITE at least one meter
SUBSTRATE alluvium, lake bottom
PRESENT VEGETATION grass, trees GROUND SURFACE VISIBILITY (%) 0
CONDITION poor
SURFACE COLLECTIONS? NO ___ YES XXX BY USD, Ken and Marie Brown DATE 11/ 1/
EXCAVATIONS? NO ___ YES XX BY USD, Ken and Marie Brown DATE 11/ 1/
WHAT WAS FOUND glass, metal, ceramics, wire, large stones (foundation?)
WHERE ARE COLLECTIONS USD, Archeology Lab
ACCESSION NUMBER(S)
PUBLICATIONS CONCERNING SITE report to St. Paul District, Corps of Engineers

complete both sides and return to
SOUTH DAKOTA ARCHAEOLOGICAL RESEARCH CENTER, BOX 152, FORT MEADE, SOUTH DAKOTA 57741

INFORMATION SUPPLIED BY Kenneth L. Brown DATE 11/10/82
ADDRESS USD Archaeology Lab, Vermillion, S.D. 57069
RECOMMENDATIONS AND/OR COMMENTS The artifacts appear to be post 1900 and the site is not deemed eligible for nomination to the National Register.

SITE NO. 39 R044
SEC 23 T 127N R 48W
PHOTO COPY OF 7.5" QUADRANGLE OR SKETCH MAP OF SITE

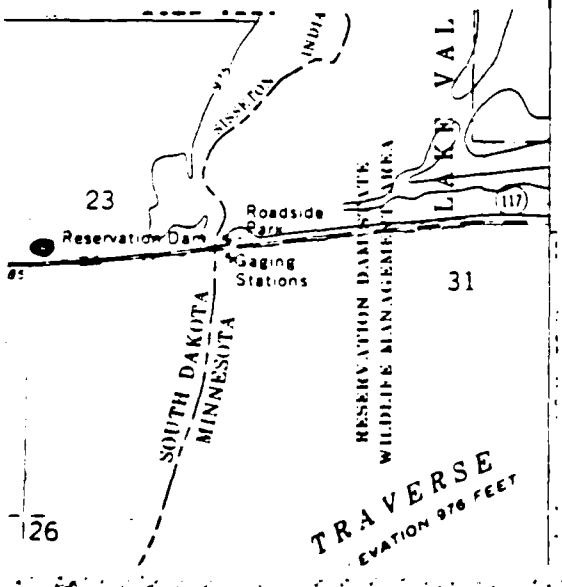
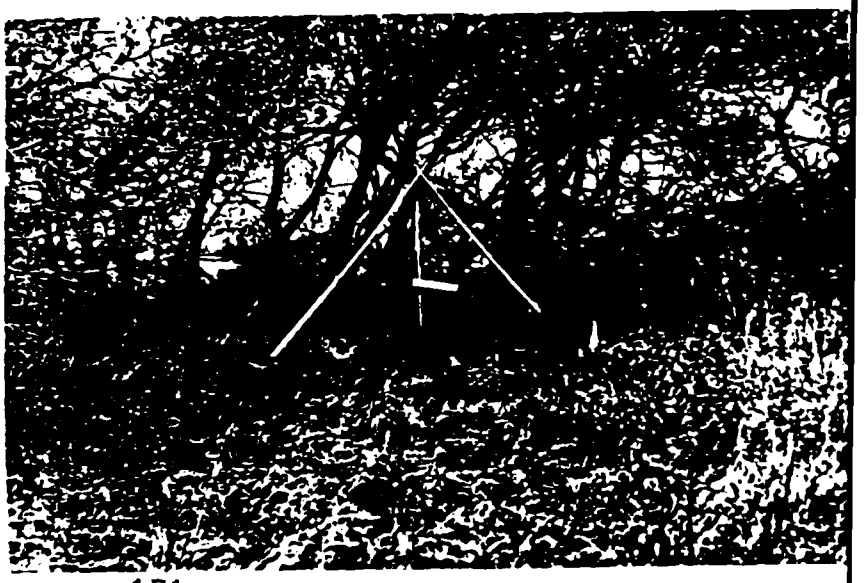


PHOTO OF SITE LOOKING east



APPENDIX B

Scope of Work

Personnel Vitae

ORDER FOR SUPPLIES OR SERVICES | DL | PAGE 1 OF 2

1. CONTRACT/PURCH ORDER NO: ...07-82-M-2193
2. DELIVERY ORDER NO:
3. DATE OF ORDER: 82 SEP 27
4. REQUISITION/PURCH REQUEST NO: NCSPD-ER-R-48
5. CERTIFIED FOR NATIONAL DEFENSE UNDER DMS REG 1: DO

6. ISSUED BY: DEPARTMENT OF THE ARMY, ST. PAUL DISTRICT, CORPS OF ENGINEERS, 1135 U.S. P.O. & CUSTOM HOUSE, ST. PAUL, MINNESOTA 55101

7. ADMINISTERED BY (If other than 6): This transaction is for the exclusive use of the United States and is exempt from the Minnesota Sales and Use Tax (... 297A, Laws, ... 1967, Ch. 32). District Engineer, U. S. Army Engineer District, St. Paul

8. DELIVERY FOB: [X] DEST [ ] OTHER (See Schedule if other)

9. CONTRACTOR/QUOTER — NAME AND ADDRESS:
ARCHAEOLOGY LABORATORY
UNIVERSITY OF SOUTH DAKOTA
VERMILLION, SD 57069

FACILITY CODE:

10. DELIVER TO FOB POINT BY: AS PER SCOPE
11. CHECK IF: [ ] SMALL BUSINESS [ ] MINORITY BUSINESS
12. DISCOUNT TERMS: NET
13. MAIL INVOICES TO: AS SHOWN IN BLOCK 15

14. SHIP TO: CORPS OF ENGINEERS, 1135 USPO & CUSTOM HOUSE, ST. PAUL, MN 55101

15. PAYMENT WILL BE MADE BY: SEND INVOICES IN DUPLICATE TO: ST. PAUL DISTRICT, C OF E, 1135 U S P.O. & CUSTOM HOUSE, ST. PAUL, MN 55101 ATTN: NCSDC-FE

MARK ALL PACKAGES AND PAPERS WITH CONTRACT OR ORDER NUMBER

16. TYPE OF ORDER:
DELIVERY — This delivery order is subject to instructions contained on this side of form only and is issued on another Government agency or in accordance with and subject to terms and conditions of above numbered contract.
PURCHASE [X] — Reference your WRITTEN QUOTE 82 SEP 21 furnish the following on terms specified herein including, for U S purchases General Provisions of Purchase Order on DD Form 1155r EXCEPT CLAUSE NO 13 APPLIES ONLY IF THIS BOX [ ] IS CHECKED AND NO 15 IF THIS BOX [X] IS CHECKED special provisions and delivery as indicated This purchase is negotiated under authority of 10 USC 2304 (a)(3) or as specified in the schedule if within the U S, its possessions or Puerto Rico; if otherwise, under 2304(a)(6).
[ ] If checked, Additional General Provisions apply. Supplier shall sign "Acceptance" on DD Form 1155r and return copies

17. ACCOUNTING AND APPROPRIATION DATA/LOCAL USE
96X3123 O&M R12820520
CB-203-05-70A0-0000

18. ITEM NO	19. SCHEDULE OF SUPPLIES/SERVICES	20. QUANTITY ORDERED/ACCEPTED*	21. UNIT	22. UNIT PRICE	23. AMOUNT
1	CULTURAL RESOURCES INVESTIGATION AT LAKE TRAVERSE, ROVERTS COUNTY, SOUTH DAKOTA, AND TRAVERSE COUNTY, MINNESOTA. THE CONTRACTOR WILL PERFORM THE SERVICES OUTLINED IN THE ATTACHED SCOPE OF WORK. CONTINUED	1	JOB		14,572.00

*If quantity accepted by the Government is same as quantity ordered, indicate by ✓ mark. If different, enter actual quantity accepted below quantity ordered and encircle.

24. UNITED STATES OF AMERICA
BY P. J. HILLESTAD CONTRACTING/ORDERING OFFICER

25. TOTAL
26. DIFFERENCES

26. QUANTITY IN COLUMN 20 HAS BEEN [ ] INSPECTED [ ] RECEIVED [ ] ACCEPTED AND CONFORMS TO THE CONTRACT EXCEPT AS NOTED
27. SHIP NO [ ] PARTIAL [ ] FINAL
28. D.O. VOUCHER NO
30. INITIALS
32. PAID BY
33. AMOUNT VERIFIED CORRECT FOR
DATE — SIGNATURE OF AUTHORIZED GOVERNMENT REPRESENTATIVE
31. PAYMENT: COMPLETE / PARTIAL / FINAL
34. CHECK NUMBER
DATE — SIGNATURE AND TITLE OF CERTIFYING OFFICER
36. RECEIVED AT — 37. DATE RECEIVED — 40. — 41. S/R ACCOUNT NUMBER — 42. S/R VOUCHER NO

DD FORM 1155 — PREVIOUS EDITION...

STANDARD FORM 36 JULY 1966 GENERAL SERVICES ADMINISTRATION FED PROC REG (41 CFR) 1-16.101	CONTINUATION SHEET	REF. NO. OF DOC BEING CONT'D. DACW37-82-M-2193	PAGE 2 OF 2

NAME OF OFFEROR OR CONTRACTOR

ARCHAEOLOGY LABORATORY

ITEM NO.	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	THE MINIMUM WAGES TO BE PAID ON THIS PROJECT, AS DETERMINED BY THE SECRETARY OF LABOR TO BE PREVAILING FOR THE CORRESPONDING CLASSES OF WORKERS EMPLOYED ON PROJECTS OF A CHARACTER SIMILAR TO THE CONTRACT WORK IN THE PERTINENT LOCALITY, MAY BE ADDED BY MODIFICATION WHEN RECEIVED FROM THE DEPARTMENT OF LABOR.				
	GENERAL PROVISIONS OF PURCHASE ORDER 1155R ARE DELETED IN THEIR ENTIRETY. THE GENERAL PROVISIONS AND REPRESENTATIONS, CERTIFICATIONS AND ACKNOWLEDGMENTS ARE ATTACHED HERETO AND MADE A PART HEREOF.				
	CONTACT PERSON: SANDY BLAYLOCK 612-725-7632				
	ORIGINAL			TOTAL	$14,572.0

SCOPE OF WORK
CULTURAL RESOURCES INVESTIGATION
AT THE LAKE TRAVERSE - BOIS DE SIOUX PROJECT,
ROBERTS COUNTY, SOUTH DAKOTA AND TRAVERSE COUNTY, MINNESOTA

1.00 INTRODUCTION

1.01 The Contractor will undertake a cultural resources investigation involving a literature and records search and review and a Phase II intensive study of 1,511.9 acres of land (including meandered lands), held in fee title by the Corps of Engineers at the Lake Traverse - Bois de Sioux project.

1.02 This cultural resources inventory is in partial fulfillment of the obligation of the Corps of Engineers (Corps) regarding cultural resources, as set forth in the National Historic Preservation Act of 1966 (Public Law (P.L.) 89-665), as amended; the National Environmental Policy Act of 1969 (P.L. 91-190); Executive Order (E.O.) 11593 for the "Protection and Enhancement of the Cultural Environment" (Federal Register, 13 May 1971); the Archaeological and Historical Preservation Act of 1974 (P.L. 93-291); the Advisory Council on Historic Preservation "Regulations for the Protection of Historic and Cultural Properties (36 CFR Part 800); the Department of the Interior guidelines concerning cultural resources (36 CFR Part 60); and the Corps of Engineers regulations (ER 1105-2-50).

1.03 The laws listed above establish the importance of Federal leadership, through the various responsible agencies, in locating and preserving cultural resources within project areas. Specific steps to comply with these laws, particularly as directed in P.L. 93-291 and E.O. 11593, are being taken by the Corps ". . . to assure that Federal plans and programs contribute to the preservation and enhancement of non-federally owned sites, structures, and objects of historical, architectural, or archaeological significance." A part of that responsibility is to locate, inventory, and nominate to the Secretary of the Interior all such sites in the project area that appear to qualify for listing on the National Register of Historic Places.

1.04 Executive Orders 11593 and the 1980 amendments to the National Historic Preservation Act further direct Federal agencies ". . . to assure that any federally owned property that might qualify for nomination is not inadvertently transferred, sold, demolished or substantially altered." In addition, the Corps is directed to administer their policies, plans, and programs so that federally and non-federally owned sites, structures, and objects of historical, architectural, or archaeological significance are preserved and maintained for the inspiration and benefit of the people.

1.05 This cultural resources investigation will serve several functions. The report will be a planning tool to aid the Corps in meeting its obligations to preserve and protect our cultural heritage. It will be a comprehensive, scholarly document that not only fulfills federally mandated legal requirements but also serves as a scientific reference for future professional studies. It will identify sites which may require additional investigations and which may have potential for public-use development. Thus, the report's content must be analytical in nature, not just descriptive.

2.01 General - Authorized by the Flood Control Act of 1936, the Lake Traverse-Bois de Sioux flood control project was approved on 28 June 1938. Construction began the latter part of 1939 and was completed in 1941. The project began operation on 1 December of that year. Lake Traverse is operated primarily for the dual purposes of flood control and water conservation.

2.02 The principal project features are the White Rock and Reservation Dams. Both dams are of rolled earth-fill construction, as is the related Brown's Valley dike. These dams have concrete and metal control structures with related spillways and stilling basins. The project also includes channel improvements and recreational facilities.

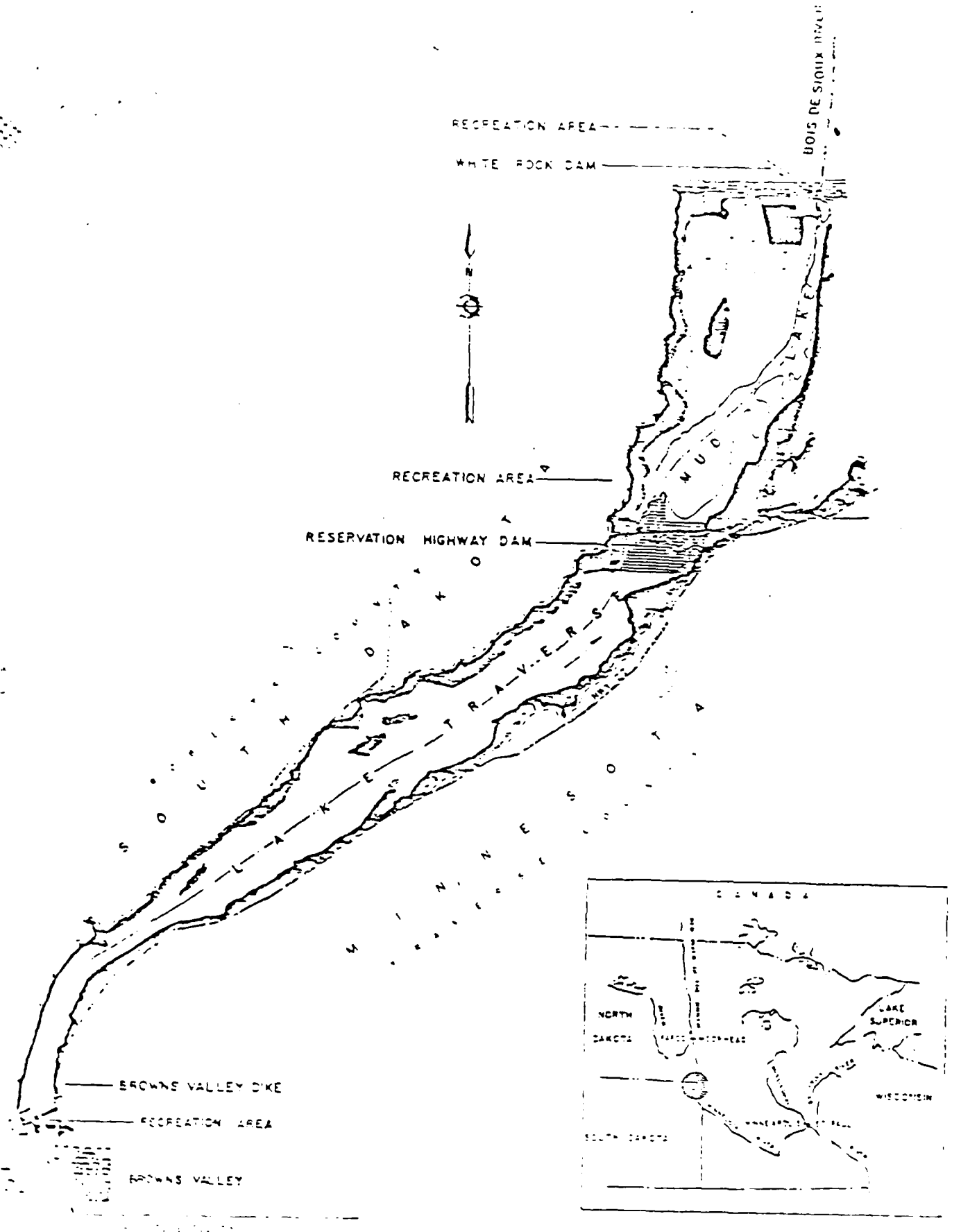
2.03 Location - The Lake Traverse-Bois de Sioux project is located on the Minnesota-South Dakota State boundary and extends from Brown's Valley, Minnesota, on the south, to approximately 6 miles south of Breckenridge, Minnesota, on the north. Lake Traverse is the headwaters of the Bois de Sioux River, the main tributary of the Red River of the North (Figure 1).

2.04 Land Use - Lake Traverse is surrounded by prairie that terminates in a series of bluffs created by the outflow of glacial Lake Agassiz. Land character in the lake area is varied, ranging from agricultural and pasture lands to marsh and bottomland vegetation. Land uses surrounding the lakes and extending to the foot of the bluffs consist primarily of intense agriculture and pasture.

2.05 Federal land around the Lake Traverse project is best described as floodplain. The majority of this land is low and subject to periodic flooding. Much is wet, consisting of marsh and bottomland hardwood vegetation. A few dry parcels consist of former agricultural and grazing lands.

2.06 Climate - The climate in the region is variable. The area is subject to cold winters and warm summers, typical of continental conditions in the temperate zone. The mean annual temperature is about 6°C (43°F), with recorded extremes of -41°C (-44°F) to 46°C (114°F). The growing season or the time between killing frosts averages about 115 days, although killing frosts have been recorded in June and August under extreme conditions. However, during the growing season, the climate is generally favorable for row crops and other small grains. The annual mean precipitation over the basin is about .56 meter (22 in.). More than 76 percent of the annual precipitation falls during April through October.

2.07 Reservoir Area - Lake Traverse (Reservation) pool stretches about 16.5 miles from the Reservation control structure to the dike at Brown's Valley, averaging about 1¼ mile wide. At the conservation pool elevation of 976.0 about mean sea level (msl), the reservoir encompasses 10,925 acres, with a capacity of 106,000 acre-feet. Capacity at full pool elevation of 981.0 msl is 164,500 acre-feet. White Rock pool, encompassing Mud Lake, is about 7.5 miles long between White Rock and Reservation Dams. At conservation pool elevation of 972.0 msl, this reservoir covers 3,850 acres and has a capacity of 6,500 acre-feet. Full pool capacity at elevation 981.0 msl is 85,500 acre-feet. The total flood storage capacity for both pools at 981.0 msl is 137,000 acre-feet.



PROJECT AREA

2.08 Water Levels - During normal winter operations, there is usually no discharge from the two control structures, which are maintained at conservation pool elevations. During a rising stage, when Reservation pool reaches 977.0, stop logs are removed to allow excess water to pass into White Rock pool. Removing the stop logs allows both pools to equalize and rise in unison, regulated by the outflow from White Rock Dam. As soon as the reservoir level drops to 976.5, the stop logs are replaced in the Reservation Dam structure to hold the conservation level of the upper pool at 976.0. The discharge from White Rock Dam is then gradually reduced until the pool level reaches conservation pool of 972.0. This stage is then maintained by reducing outflow to equal inflow. During the winter months, no drawdown of the pools is necessary since evaporation loss by freeze-up usually amounts to 2 feet or more in Mud Lake and about 1 foot in Lake Traverse.

2.09 Soils - Soils of the Lake Traverse project area are of 19 soil series in six soil associations. These soils range from alluvial, very poorly-drained types in lowland areas to deep, well-drained loams on the uplands.

2.10 Project Lands - Corps land around Lake Traverse consists of 1,521.9 acres in fee ownership (including meandered lands) and 6,172 acres in flowage easement. Of the land in fee ownership, 955.9 acres are leased: 945.9 acres to the Minnesota Department of Natural Resources (DNR) for wildlife management and access, and 10 acres to Traverse County for recreation. Of the lands remaining in Corps control, 7.5 acres are devoted to three public-use areas and project operations, with the remainder designated as wildlife management lands.

2.11 Vegetation - Within the project lands, the terrestrial vegetation on the lands (1,511.9 acres) consists of six broad types: agricultural - 42 (3%) acres, grassland - 443 (29%) acres, wetlands - 425 (28%) acres, woody - 98 (6.5%) acres, water - 496.4 (33%) acres, and recreation and residential - 7.5 (.5%) acres.

3.00 DEFINITIONS

3.01 For the purpose of this study, the cultural resources investigation will include a Phase I on-the-ground reconnaissance level survey. Phase II testing will not be conducted at this time.

3.02 "Cultural resources" are defined to include any building, site, district, structure, object, data, or other material relating to the history, architecture, archaeology, or culture of an area.

3.03 "Literature and records search" is defined as a search for and examination of written reports, books, articles, files, records, etc., published and unpublished (found in private, local, State, and Federal depositories), which are pertinent to the cultural resources investigation to be carried out for a particular project. The purposes of the literature and records search are: to familiarize the Contractor with the culture history of the study area and past investigations which have been carried out in the area; to document the location and condition of known sites within the project area, the extent of past work undertaken at the site, and any other information that may be relevant in assessing the significance of the site; and to provide this information in a summarized form to the agency requesting the search. Although existing data may be extensive, the literature and records search should be as comprehensive as possible in providing a usable body of data for the purposes outlined above (see Sections 5.10-5.12).

3.04 "Literature and records review" is defined as the review and evaluation of the pertinent literature and records defined in Section 3.03. The purpose of the literature and records review is to provide the sponsoring agency with the contractor's professional opinion on the nature, extent, and quality of the sources identified in the literature and records search (see Sections 5.10-5.12).

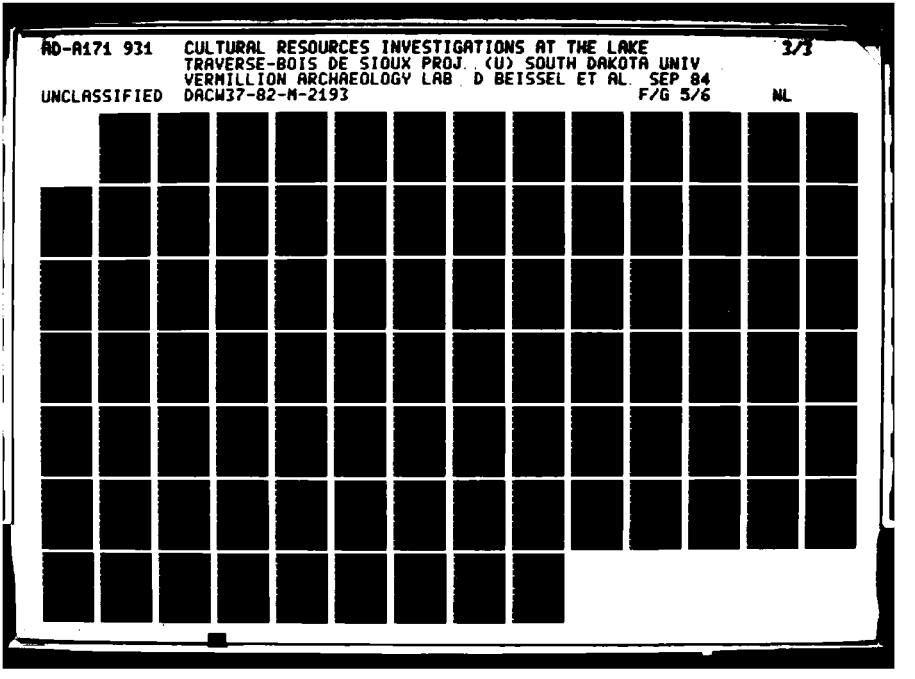
3.05 "Phase II Intensive Study" will consist of a 100-percent field survey of all project areas. It will use data collection methods (e.g., subsurface testing) sufficient to determine the site size, density, depth, elevation, cultural affiliation, and geographic relationship to the proposed project features. It will assess the direct, indirect, and varying levels of impact of all project features on all the area's cultural resource sites (archaeological, historic, and architectural) and on the data base. The intensive study will also determine each site's potential or probable scientific significance and potential or probable National Register eligibility; it will determine which sites qualify for Phase III testing; and it will develop a complete and detailed Phase III testing and research program, including the testing needs and plan, staff, and person-days/hours necessary to complete all aspects of the program. The survey field methods will follow those outlined in Sections 5.13-5.17 and 6.03m of this scope of work. (See other scope of work sections for complete study and report requirements.)

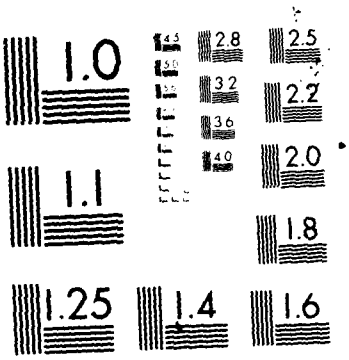
3.06 "Phase III Testing and Research" will involve formal testing or research of all the cultural resource sites (archaeological, historic, and architectural) that are identified in the Phase II intensive study as potentially able to provide cultural/behavioral/scientific information to answer important research questions, and that are potentially or probably eligible for the National Register. The testing and research study will require intensive collection of field and/or literature archival data; evaluation and analysis of the data; completion of any other necessary associated studies; detailed description of each site; evaluation of significance; determination and preparation of forms for the National Register eligibility of all sites; assessment of the direct, indirect, and varying levels of impact of the proposed project features on all the area's cultural resource sites and data base; and development of a complete and detailed mitigation plan, including the mitigation needs and plans, plus alternative approaches with priorities identified for reducing or avoiding adverse impacts, staff, and person-days/hours necessary to complete all aspects of the program.

4.00 SURVEY/CONTRACT SPECIFICATIONS

4.01 The goal of this contract is to conduct a literature and records search and review and a Phase II intensive study of 1,511.9 acres of land (including meandering lands) held in fee title by the Corps of Engineers at the Lake Traverse-Bois de Sioux project, located in Roberts County, South Dakota and in Traverse County, Minnesota.

4.02 The objective of the study will be to conduct a 100% survey and research of all Corps lands held in fee title; locate and describe all archaeological, historical and architectural sites; determine the direct and indirect impacts that changing reservoir water levels (see Section 2.08), erosion due to wave action, and recreation have on each site; determine each site's potential or probable scientific significance and potential or probable National Register eligibility; determine which sites qualify for Phase III testing; and develop a complete and detailed Phase III testing and research program.


AD-A171 931 CULTURAL RESOURCES INVESTIGATIONS AT THE LAKE 3/3
TRAVERSE-BOIS DE SIOUX PROJ. (U) SOUTH DAKOTA UNIV
VERMILLION ARCHAEOLOGY LAB D BEISSEL ET AL. SEP 84
UNCLASSIFIED DACW37-82-M-2193 F/G 5/6 NL



c. The Contractor will obtain from the Minnesota and South Dakota State Historic Preservation Office information regarding any cultural resources in the project area that have been nominated or are being considered for nomination to the National Register of Historic Places, and will report the results in the contract report.

d. Consultation with other professionals familiar with cultural resources in the area.

e. Consultations with amateur archaeologists, historians, and individuals concerned with local archaeology and history in order to locate sites and to identify and define local interests and resources perceived to be locally significant.

5.11 A review and evaluation of previous archaeological and historical studies of the study area and region (including who conducted the work and the date, extent, and adequacy of the past work as it reflects on the interpretation of what has been done in the area) should be undertaken and summarized in the Contractor's report.

5.12 The literature and records search and review shall include all the sites (historic and prehistoric) identified during the course of the study and an evaluation of the direct and indirect impact upon them of all the proposed project alternatives and features.

5.13 Phase II Intensive Study Field Methods (see also Section 3.05): The on-the-ground examination will involve a 100-percent survey and subsurface informal testing of the area to determine the total number and extent of cultural resources present (see Section 3.05 for other goals and requirements). These resources include standing architectural structures as well as historic and prehistoric archaeological sites.

5.14 The Contractor will relocate all previously recorded cultural resources known to exist in the project area, report their condition, evaluate the impact of project impacts upon them, and update the State site forms or National Register forms. All relocated sites will be investigated and reported in the same fashion as newly discovered sites.

5.15 The Contractor's survey will include surface inspection in areas where surface visibility permits adequate recovery of cultural materials and subsurface testing in all areas where surface visibility is limited or obscured. Subsurface investigation will include shovel testing, coring, soil borings, cut bank profiling or some other appropriate testing method. If field methods vary from those required, they must be described and justified in the report.

5.16 The recommended survey grid or transect interval is 15 meters (50 feet) and testing interval is 15 meters (50 feet). However, this interval may vary depending upon field or site density/size conditions. If the recommended interval is not used, justification should be presented in the report for selection of an alternate interval. All subsurface tests will be screened through 1/4-inch mesh hardware cloth and will be recorded on appropriate testing forms. All subsurface testing forms will be included in the appendix to the Contractor's report. The Contractor will also indicate the locations of all subsurface tests on USGS and/or project maps and key these with the testing forms in the appendix.

5.17 When a cultural resource site is relocated or discovered, the Contractor will collect sufficient data (topographic, soil, cultural, etc.) to complete the appropriate study and report requirements. (See appropriate scope of work sections for details). All sites relocated or discovered will be informally, subsurface tested to determine the possible site depth, density, if subsurface remains are present, and to help assess if a site needs to be formally tested.

6.00 GENERAL REPORT REQUIREMENTS

6.01 The Contractor will submit the following types of reports, which are described in this section and in Section 9.00: progress report, field notes, draft contract report, final contract report, and a popular report.

6.02 For each reference discussed in the technical contract report, the Contractor must cite the author, date, and page numbers.

6.03 The Contractor's technical report shall include, but shall not necessarily be limited to, the following information:

a. Title Page: Note the type of investigation undertaken, the cultural resources assessed (archaeological, historical, and architectural), the project name and location (county and State), the date of the report, the Contractor's name, the contract number, the name of the author(s) and/or Principal Investigator, the signature of the Principal Investigator, and the agencies for which the report is being prepared.

b. Abstract: An abstract of findings, conclusions, and recommendations. This should not be an annotation.

c. Management Summary: Concisely summarize the study, which will contain all essential data for using the document in the Corps management of the project. This information will minimally include who the sponsor is and why the work was undertaken, a summary of the study (literature and records search and review, including the National Register of Historic Places, dates checked, and results; field work; lab analysis), study limitations, study results, significance, recommendations, and identification of the repository of all pertinent records and artifacts.

d. Table of Contents.

e. List of Figures.

f. List of Plates.

g. Introduction: Identify the sponsor (Corps of Engineers) and the sponsors' reason for the study; rpovide an overview of the sponsors' project with the project area located on USGS quad maps and/or Corps project maps; define the location and boundaries of the study area (with regional or State and area-specific maps); reference this scope of work (to be included in the appendix to the Contractor's report); identify the institute that did the work, the number of people involved in the study, the number of person-days/hours spent during the study; and identify the dates when the various types of work were conducted.

h. Environmental Background: Description of the study area and regional environment, including the following categories; geology, vegetation, fauna, climate, topography, physiography, and soils, with reference to prehistoric, historic, ethnographic, and contemporary periods. Any information available on the relationship of the environmental setting to the area's prehistory/history should be included. This section should be of a length commensurate with other report sections.

i. Previous Archaeological and Historical Studies: Provide a summary and evaluation of previous archaeological and historical studies of the project area and region, including the researchers, date, extent, adequacy of the past work, study results, and cultural/behavioral inferences derived from each study.

j. Regional Prehistory and History: Discussions should include regional cultural developments spatially and chronologically; environmental adaptations; subsistence, resource procurement, and settlement patterns; site/population density and size; and any other pertinent information on the prehistory, protohistory, and history of the study area and region.

k. Theoretical and Methodological Overview: Describe or state the goals of the Corps and the study researcher, the theoretical and methodological orientation of the study, and the research strategies applied to achieve the stated goals.

l. Literature and Records Search and Review: Describe, in detail, the methodology and sources used for the literature and records search and review as well as a description and evaluation of all information and data recovered. Include bibliographic information at the end of the report. (See Sections 3.03, 3.04, 5.10, 5.11, and 6.12.)

m. Field Methods: Describe specific archaeological, historical, and architectural activities undertaken to achieve the stated theoretical and methodological goals. Include all field methods, techniques, strategies, and a rationale or justification for specific methods or decisions. The description of the field methods shall minimally include: a description of the areas surveyed, survey conditions, topographic/physiographic features, vegetation conditions, geomorphology, soil types, informal testing, stratigraphy results, survey limitations, survey testing results with all appropriate testing forms to be included as an appendix (e.g., shovel tests, coring, cut bank profiles, etc.), degree of surface visibility, whether or not the survey resulted in the location of any cultural resources, the methods used to survey the area (pedestrian reconnaissance, subsurface test, etc.), the justification and rationale for eliminating uninvestigated areas, and the grid or transect interval used. Testing methods shall include descriptions of test units (size, intervals, stratigraphy, depth) and the rationale behind their placement.

n. Analysis: Describe and provide the rationale for the specific analytic methods and techniques used, and describe and discuss the qualitative and quantitative manipulation of the data. Limitations or problems with the analysis based on the data collection results will also be discussed. This section shall also contain references to accession numbers used for all collections, photographs, and field notes obtained during the study, and the location where they are permanently housed. All diagnostic artifacts will be illustrated or photographed and included in the report.

o. Investigation Results: Describe all the archaeological, historic, and architectural resources encountered during the study, and any other data (e.g., literature, archival, other studies) pertinent to a complete understanding of the resources within the study area. Include enough empirical data that the study results can be independently assessed. The description of the data shall minimally include: a description of the site; amounts and type of material remains recovered; relation of the site or sites to physiographic features, vegetation, geomorphology, and soil types, project alternatives, and direct and indirect impact areas; analysis of the site/sites and data (e.g., site/s type, depth, density, distribution, cultural historical components and information, environmental, cultural/behavioral inferences or patterns); site condition; and location and size information (elevation, complete quad map source, legal description, address if appropriate, and site size, density, depth, and extent). The information shall be presented in a manner that can be used easily and efficiently by the Corps of Engineers.

Each discovered or relocated site will be plotted on a legible USGS map and COE project map. Each site location in relation to relevant project features will also be shown on legible USGS maps and COE project maps. If a site location has not been field-verified, the Contractor must indicate the approximate area on the maps and indicate that it has not been verified.

Site boundaries with legal and UTM coordinates will be delineated for all relocated and newly discovered sites, and all official site records (e.g., State site forms, National Register forms) will be completed or updated as necessary.

Additionally, USGS and/or project maps will indicate the areas surveyed and the survey methods employed (pedestrian walkover, subsurface tests). The location of each informal subsurface test will be placed on the map and keyed with the testing forms in the appendix. The maps will also indicate those areas that were eliminated from the survey due to unacceptable survey conditions.

All maps will be labeled with a typed or drafted caption/description, a north arrow, a scale bar, township, range, map size, and dates, and the map source (e.g., the USGS quad name, project map title, or published source) and will have proper margins. Maps that are too large to be incorporated in the report may be folded and inclosed at the back of the report or submitted as a submittal. Fold-out maps within the report text are acceptable.

All sites will be recorded on the appropriate State site forms (to be included in the appendix). Inventoried sites shall include a site number. However, if temporary site numbers will be used in either the draft or final reports, they shall be substantially different from the official site designations to avoid confusion or duplication of site numbers. Known sites shall have their State site forms and other forms (e.g., National Register) updated, and included in the appendix.

p. Evaluation and Conclusions: Evaluate and formulate conclusions concerning site/sites location, density, size, condition, distribution, and significance in relation to the local and regional archaeology, history, and architecture, and in relation to the direct and indirect impacts of the project features on them, and discuss the potential and goals for future research. Discuss the reliability of the analysis or other pertinent data recovered (e.g., site locations, types, distribution, etc.); relate results of the study and analysis to the stated study goals; identify changes, if any, in the research goals; synthesize and compare the results of the analysis and study; integrate other associated studies or data; and identify and discuss environmental and cultural/behavioral patterns and processes that are inferred from the study and analysis results.

q. Recommendations: Discuss the direct, indirect, and varying levels of impacts of the project features on the area's cultural resources with specific management recommendations on all previously recorded and newly discovered sites; discuss the scientific significance of all sites to the extent permitted by the study level in relation to the research goals established in the study; make recommendations on the potential or probable eligibility of all sites to the National Register of Historic Places; make recommendations with regard to the Corps planning goals and project features; and develop a Phase II intensive study program or Phase III testing and research program as defined in Sections 3.05 and 3.06 of this scope of work. If it is the Contractor's assessment that no significant resources exist in the project area, the methods of investigation and reasoning which support that conclusion will be presented. If certain areas are not accessible, recommendations will be made for future investigation needs. Any evidence of cultural resources or materials which have been previously disturbed or destroyed will be presented and explained.

r. References: Provide standard bibliographic references (American Antiquity forms) for every publication cited in the report. References not cited specifically in the report text will be listed in a separate "Additional References" section.

s. Appendix: Include the scope of work, resumes of all personnel involved, all correspondence derived from the study, all State or National Register site forms, all testing forms, and any other pertinent report information referenced in the text as included in the appendix.

6.04 All of these report requirements will be completed upon submittal of the draft contract report. Failure to fulfill these report requirements will result in the rejection of the report by the Contracting Officer.

7.00 FORMAT SPECIFICATIONS

7.01 The Contractor shall submit to the Contracting Officer the photographic negatives for all photographs in the final report.

7.02 All text materials will be typed, single-spaced (the draft report should be space-and-one-half or double-spaced), on good quality bond paper, 8.5 inches by 11.0 inches, with a 1.5-inch binding margin on the left, 1-inch margins on the top and right, and a 1.5-inch margin at the bottom, and will be printed on both sides of the paper.

7.03 Information will be presented in textual, tabular, and graphic forms, whichever are most appropriate, effective, or advantageous to communicate the necessary information.

7.04 All figures and maps must be clear, legible, self-explanatory, and of sufficiently high quality to be readily reproducible by standard xerographic equipment, and will have margins as defined above.

7.05 The final report cover letter shall include a budget of the project.

7.06 The draft and final reports will be divided into easily discernible chapters, with appropriate page separation and heading.

8.00 MATERIALS PROVIDED

8.01 The Contracting Officer will furnish the Contractor with the following materials:

a. Access to any publications, records, maps, or photographs that are on file at the St. Paul District, Corps of Engineers.

b. Two sets of USGS Quadrangle maps of the project area. One set will be used as field maps, and one set will be returned with the appropriate information (see Section 6.03o).

c. Two sets of project maps. One set will be used as field maps, and one set will be returned with the appropriate information (see Section 6.03o).

9.00 SUBMITTALS

9.01 The Contractor will submit reports according to the following schedules:

a. Progress Reports: On the first of every month, a short progress report will be submitted detailing the work that has been accomplished, any needs the Contractor may have, and any problems the Corps should be made aware of.

b. Project Field Notes: One legible copy of all the project field notes will be submitted with the first progress report.

c. Draft Contract Report: Ten copies of the draft contract report will be submitted on or before 150 days after contract award. The draft contract report will be reviewed by the Corps of Engineers, the State Historic Preservation Officer, the State Archaeologist, and the National Park Service. The draft contract report will be submitted according to the report and contract specifications outlined in this scope of work.

d. Final Contract Report: The original and 15 copies of the final contract report will be submitted 30 days after the Corps of Engineers comments on the draft contract report are received by the Contractor. The final contract report will incorporate all the comments made on the draft contract report.

e. Popular Report: A draft popular report will be submitted with the draft contract report, and will be reviewed by the Corps of Engineers. Fifteen copies of the final popular report will be submitted with the final contract report. The popular report shall be a condensed version of the contract report that would be of interest to the general public. The report shall provide an overview of the archaeology, protohistory, history and architecture of the project area and region, a brief review of the work conducted in the area and the reasons (both professional and managerial) why the work was conducted, and the results of the completed survey. Exact site locations will be reported in the popular report.

f. Site Forms: All newly completed and updated State site forms will be submitted to the appropriate State agency.

9.02 Neither the Contractor nor his representative shall release any sketch, photograph, report, or other material of any nature obtained or prepared under the contract without specific written approval of the Contracting Officer prior to the acceptance of the final report by the Government. After the Contracting Officer has accepted the final report, distribution will not be restricted by either party except that data relating to the specific location of extant sites will be deleted in distributions to the public.

10.00 METHOD OF PAYMENT

10.01 Payment for all work performed under this contract will be made in a lump sum upon approval of the final report by the Contracting Officer.

Vita

Kenneth L. Brown

DATE AND PLACE OF BIRTH

November 10, 1951, Liberty, Missouri

MARITAL STATUS

Married, 1980, Marie E. Klon

CHILDREN

Jennifer M. Brown, April 14, 1981

OFFICE ADDRESS

Archaeology Laboratory, University of South Dakota, Vermillion, South Dakota, 57069. Phone: 605-677-5401

HOME ADDRESS

414 N. Plum, Vermillion, South Dakota, 57069. Phone: 605-624-6416

EDUCATION

1980 M. Phil. Anthropology, University of Kansas

1977 M.A. Anthropology, University of Kansas

1974 B.A. Anthropology (with honors) and Sociology, University of Kansas

1972 A.A. Kansas City Metropolitan Junior College

1970 Liberty High School, Liberty, Missouri

ARCHAEOLOGICAL EXPERIENCE

1981-1983 Principal Investigator, University of South Dakota, for contracts awarded: Red River of the North Ring Levees survey, Pembina and Walsh Counties, N.D. (in progress); Lake Traverse survey, S.D. and Minn. (in progress); Cultural resources survey along the Pembina River, N.D.; Upper Minnesota River Project, northeastern S.D. and southwestern Minn.; and many small contracts.

1982 Principal Investigator, (May - June) Test excavations of four sites in the proposed Lonetree Reservoir, North Dakota.

1982 Principal Investigator, Dakota Interactive Services, Inc. (May - June) Survey of prehistoric and historic sites around Jamestown Reservoir, North Dakota.

1981 Principal Investigator, Dakota Interactive Services, Inc. (August - October). Survey of prehistoric and historic sites in Waubay National Wildlife Refuge, South Dakota.

1980 Archaeological Field Mapper, Luther College, (October), the mapping of the Blood Run site, Northwestern Iowa.

1980 Archaeological Field Supervisor, University of South Dakota, (June-August), the survey and testing of prehistoric sites in Brushy Creek State Park, Iowa.

1979 Archaeological Field Assistant, University of Kansas, (July-August), in the El Dorado Lake Project, Southeastern Kansas. Testing and excavating historic sites.

1978 Archaeological Field Supervisor, University of Kansas, (June-August), in Kansas City, Missouri. Excavating Late Archaic and Late Woodland sites along the Little Blue River.

1976 Archaeological Survey Supervisor, University of Kansas, (June-August), in Kansas City, Missouri. Testing Late Archaic to Mississippian sites along the Little Blue River.

1975 Archaeological Survey Supervisor, University of Kansas, (June-August), in the Cimarron National Grassland, Southwestern Kansas.

1975 Archaeological Survey Assistant, University of Kansas, (April-May), Little Blue River, Kansas City, Missouri.

1975 Archaeological Surveyor, University of Kansas, (January), Cimmarron National Grassland, Southwestern Kansas.

1974 Archaeological Survey Assistant, University of Kansas (August), in Anderson and Linn Counties, Southeastern Kansas.

1974 Archaeological Field Laboratory Assistant, University of Kansas, (June-August), Coffey Site, Manhattan, Kansas. A Middle Plains Archaic and Late Archaic hunting and gathering camp.

1973 Excavator, Kansas Archaeological Field School (June-August), in Kansas City, Missouri. A Kansas City Hopewell village and Steed-Kisker burial mound.

ORGANIZATIONS

Society for American Archaeology
Plains Anthropological Association
South Dakota Archaeological Society
North Dakota Archaeological Association
Minnesota Archaeological Society
Minnesota Historical Society
Lambda Alpha

Graduate Student President, Graduate Student Colloquium in Anthropology, University of Kansas, September, 1976 - September, 1977. September, 1978 - September, 1979.

Graduate Student Vice-President, Graduate Student Colloquium in Anthropology, University of Kansas, January, 1976 - September, 1976.

Graduate Student Representative, Graduate Student Colloquium in Anthropology, University of Kansas, September, 1974 - September, 1977.

PAPER PRESENTATIONS

1975 33rd Plains Conference, Lincoln, Nebraska. "An Archaeological Survey of the Cimarron National Grassland, Southwestern Kansas."

1977 35th Plains Conference, Lincoln, Nebraska. "Late Prehistoric Settlement Patterns in Southwestern Kansas."

1978 36th Plains Conference, Denver, Colorado. "Archaeological Excavations at the Seven Acres Site, 23JA115, Jackson County, Missouri."

1979 37th Plains Conference, Kansas City, Missouri. "A New Archaeological Complex in the Kansas City Locality: the Maybrook Phase."

1983 5th Annual Flint Hills/Osage Hills Conference, Topeka, Kansas. "Absolute Chronology for the Pomona Focus and Associated Complexes: The Radiocarbon Evidence."

PUBLICATIONS (articles)

1976 A Search for Patterns in the Horizontal and Vertical Distribution of Artifacts in the Kansas City Hopewell Component at the Young Site, (23PL4). University of Kansas, Publications in Anthropology 8, A.E. Johnson,(ed.). Lawrence.

1977 (with Mary Adair). Prehistoric Cultural Resources in Kansas: Some Problem Areas. Kansas Anthropological Association Newsletter 22(9).

1979 Late Prehistoric Settlement Patterns in Southwestern Kansas. Plains Anthropologist 24(85):191-206.

1981 (with Robert Ziegler). Nebo Hill Settlement Patterns in Northwestern Missouri. Missouri Archaeologist, 42:43-55.

1982 (with Marie E. Brown and Ned H. Hanenberger). Prehistoric Stone Tools of South Dakota: A Guide. South Dakota Archaeological Society, Special Publication, No. 6. Vermillion.

CONTRACT ARCHAEOLOGY PUBLICATIONS

1974 (With David Evans and Marc Rucker). An Appraisal of the Archaeological Resources of the Big Sugar Creek Watershed, Anderson and Linn Counties, Kansas. Report submitted to the National Park Service.

1975 An Appraisal of Archaeological Resources Along the Right-of-Way of a Proposed Road North of the Cimarron River in the Eighty-One Pasture of the Cimarron National Grassland District of the San Isabel National Forest. Report submitted to the U.S. Department of Agriculture, Forest Service.

1976 Prehistoric Cultural Resources of the Cimarron National Grassland, Morton and Stevens Counties, Kansas. Report submitted to the U.S. Department of Agriculture, Forest Service.

1976 (with Mark Baumler). Little Blue River Channel-Modification Project, Archaeological Research Design. Report submitted to the U.S. Army Corps of Engineers, Kansas City District.

1977 (With Byron Dixon, Rebecca Filer, Dankers Lauderdale, Patricia Miller, Curtis Sorenson, and Robert Ziegler). Historic and Prehistoric Cultural Resources in the Longview and Blue Springs Lakes, Jackson County, Missouri. Report submitted to the U.S. Army Corps of Engineers, Kansas City District.

1978 Evaluations and Recommendations for the Historical, Architectural and Paleontological Resources at Blue Springs and Longview Lakes, Jackson County, Missouri. (Supplement to the volume: Historic and Prehistoric Cultural Resources of the Blue Springs and Longview Lakes, Jacson County, Missouri). Report submitted to the U.S. Army Corps of Engineers, Kansas City District.

1979 (with Byron Dixon and Susan Richards). Historic and Prehistoric Cultural Resources Along the Proposed Channel of West Fire Prairie Creek, Jackson County, Missouri. Report submitted to the U.S. Army Corps of Engineers, Kansas City District.

1981 (with Robert Ziegler, assemblers). Prehistoric Cultural Resources Within the Right-of-Way of the Proposed Little Blue River Channel, Jackson County, Missouri. Report submitted to the U.S. Army Corps of Engineers, Kansas City District.

1982 Archaeological Testing of Historic Sites in the El Dorado Lake Area. In Archaeological Investigations at El Dorado Lake, Butler County, Kansas (Phase III). Compiled by P.E. Brockington, Jr. Report submitted to the Tulsa District, U.S. Army Corps of Engineers.

1982 (with other authors). Cultural Resources Along the South Dakota Segment of the Northern Border Pipeline. Report submitted to the Northern Border Natural Gas Company, Omaha.

1982 (with Marie Brown and Karen Zimmerman). Archaeological and Historical Reconnaissance and Literature Search of Cultural Resources within the Pembina River Project, Pembina and Cavalier Counties, North Dakota. Report submitted to the U.S. Army Corps of Engineers, St. Paul District.

1982 (with Marie Brown and Karen Zimmerman). Prehistoric and Historic Resources within the Jamestown Reservoir Project. Report submitted to the Bureau of Reclamation.

1982 A Cultural Resources Survey of the Fort Yates Irrigation Project, Sioux County, North Dakota. Report submitted to the Bureau of Indian Affairs.

1982 A Cultural Resources Survey of the Shenandoah, Iowa, Airport Expansion Project. Report submitted to H. Gene McKeown and Associates, Inc.

1982 A Cultural Resources Survey of Wastewater Collection and Treatment Facilities At Lake Madison, Lake County, South Dakota. Report submitted to the Lake Madison Sanitary District and Schmitz, Kalda & Associates.

1982 (with Marie Brown and Karen Zimmerman). A Cultural Resources Survey of the Upper Minnesota River. Report submitted to the St. Paul District, U.S. Army Corps of Engineers.

1982 (with Marie Brown). Test Excavations of Four Sites in the Proposed Lonetree Dam and Dikes and New Rockford Canal, Wells County, North Dakota. Report submitted to the Bureau of Reclamation.

1982 A Cultural Resources Survey of the Proposed Indian Health Service Hospital, Rosebud, South Dakota. Report submitted to the Indian Health Service, Aberdeen, South Dakota.

1982 (Dale Henning, Principal Investigator)
Evaluative Investigations of Three Landmark Sites in Northwest Iowa. Luther College Archaeological Research Center, Decorah, Iowa.

1983 A Cultural Resources Survey of the Proposed Indian Health Service Facility, Fort Thompson, South Dakota. Report submitted to the Indian Health Service, Aberdeen, South Dakota.

1983 (with Marie Brown). A Cultural Resources Survey of the Lower Brule Sioux Tribal Farm Irrigation Development Project #05-01-02084, Stanley County, South Dakota. Report submitted to the Lower Brule Sioux Tribe.

1983 (with Marie Brown). Test Excavations at Site 13WD405, Woodbury County, Northwestern Iowa. Report submitted to the Office of the State Archaeologist of Iowa.

1983 (with Marie Brown). Cultural Resource Investigations of the Walhalla Alcohol Fuel Plant Facility, Pembina County, North Dakota. Report submitted to City of Walhalla and Red River Regional Planning Council, Grafton, N.D.

1983 (with Marie Brown). A Cultural Resources Survey of Three Timber Harvest Areas Within the Rosebud Timber Reserve, Todd County, South Dakota. Report submitted to Bureau of Indian Affairs, Aberdeen, S.D. and Rosebud Sioux Tribe.

TEACHING EXPERIENCE

1981 Fall, Instructor, University of South Dakota, Introduction to Physical Anthropology, Anthropology 220.

1980 Spring, Instructor, University of Kansas, North American Archaeology, Anthropology 504.

1979 Fall, Instructor, University of Kansas, Introduction to Physical Anthropology, Anthropology 304.

1979 (Spring) and 1978 (Fall), Instructor (with Robert Ziegler). An Invitation to Great Plains Archaeology. A six week adult class sponsored by Museums Associates, Museum of Natural History, University of Kansas.

PRESENT PROFESSIONAL POSITIONS

Director, University of South Dakota Archaeology Laboratory (fall 1982 to present).

Principal Investigator of Contract Archaeology, University of South Dakota Archaeology Laboratory (fall 1980 to present).

PROFESSIONAL INTERESTS AND EXPERTISE

North American Indians, Archaeology of the Plains and Eastern United States, Settlement Patterns, Cultural Ecology, Lithic Technology, Lithic Use-Wear Analysis, Ceramic Analysis, Computer Applications to Archaeological Problems.

REFERENCES

Dr. Larry Zimmerman
Director, Anthropology Program
Department of Social Behavior
University of South Dakota
Vermillion, South Dakota 57069
605-677-5401

Dr. Alfred E. Johnson
Director, Museum of Anthropology
University of Kansas
Lawrence, Kansas 66045
913-864-4245

Dr. Dale Henning
Department of Anthropology
Luther College
Decorah, Iowa 52101
319-387-1283

Vita

Marie E. Brown

DATE AND PLACE OF BIRTH

October 10, 1950, Milwaukee, Wisconsin

MARITAL STATUS

Married, 1980, Kenneth L. Brown

CHILDREN

Jennifer M. Brown, April 14, 1981

OFFICE ADDRESS

Archaeology Laboratory, University of South Dakota, Vermillion, South Dakota, 57069. Phone: 605-677-5401

HOME ADDRESS

414 N. Plum, Vermillion, South Dakota, 57069. Phone: 605-624-6416

EDUCATION

1982 M.A. Anthropology, University of Kansas

1972 B.A. Anthropology, Marquette University

1968 Our Lady of Mercy High School, Milwaukee, Wisconsin

ARCHAEOLOGICAL FIELD EXPERIENCE

1982 Archaeological Field Director. Test Excavations of four sites in the proposed Lonetree Reservoir, North Dakota.

1982-1983 Archaeological Field Assistant, University of South Dakota. Survey at: Lake Traverse, South Dakota; Upper Minnesota River, South Dakota and Minnesota; Lake Madison, South Dakota; Shenandoah, Iowa; Ft. Yates, North Dakota; Test excavations at site 13WD405, Sioux City, Iowa; Survey of Indian Health Service Hospitals, Rosebud and Fort Thompson, S.D.; Survey of Clarke Ranch, Lower Brule, S.D.; Survey of Timber Harvest Areas, Rosebud, S.D.

1982 Archaeological Field Assistant, Dakota Interactive Services, Inc. Survey of prehistoric and historic sites around Jamestown Reservoir, North Dakota.

1981 Archaeological Field Assistant, University of South Dakota. Survey of prehistoric and historic sites along Pembina River, North Dakota.

1980 Archaeological Field Mapper, Luther College. The Mapping of the Blood Run Site, Northwestern Iowa.

1980 Archaeological Field Supervisor, University of South Dakota. Surveying and testing of prehistoric sites in Brushy Creek State Park, Iowa.

1979 Archaeological Field Assistant, El Dorado Lake, Kansas. Excavated a Woodland site.

1979 Excavator, Little Blue River Project, Kansas City Missouri. Tested an Early Woodland site.

1978 Archaeological Field Assistant, El Dorado, Kansas. Excavated a Woodland site.

1978 Field Assistant, Cultural Resource Reconnaissance, Missouri State Highway Commission.

1975 Archaeological Field Foreman, Chief Joseph Reservoir Archaeological Research Project, Washington. Tested prehistoric sites.

1974 Assistant Field Foreman, Alpowa Project, Washington. Excavated a prehistoric site assigned to the Harder Phase.

1973 Archaeological excavator, Alpowa Project, Washington. Excavated a prehistoric site assigned to the Harder Phase.

1972 Excavator, Washington State University Field School, Alpowa Project, Washington. Excavated a site assigned to the Harder Phase.

1971 Excavator, Sacramento State College Field School, Samwell Cave, California. Excavated a Paleo-Indian site.

ARCHAEOLOGICAL LABORATORY EXPERIENCE

1982, Fall to Present, Supervisor, The University of South Dakota Archaeology Laboratory.

1980-1982 Research Associate, University of South Dakota. Analysis of artifacts from: Pembina River, North Dakota; Northern Border Natural Gas Pipeline, South Dakota, Upper Minnesota River, South Dakota and Minnesota, and numerous small projects.

1979-1980 Research Assistant, Analysis of cultural material from 14BU57, El Dorado Lake, Kansas.

1978-1979 Research Assistant, Analysis of lithics, ceramics and faunal remains from 14BU55, El Dorado Lake, Kansas.

1977 Laboratory Assistant, cataloging artifacts from the El Dorado Lake Project, Kansas.

1975 Laboratory Assistant, cleaning and cataloging artifacts from the Chief Joseph Reservoir Research Project, Washington.

1975 Laboratory Assistant, preliminary analysis of utilized flakes from the Alpowa Project, Washington.

RESEARCH INTERESTS AND EXPERTISE

Plains and Plateau Archaeology, Faunal Analysis, Bone Tool Technology and Wear Patterns, Cultural Ecology and Subsistence Patterns.

PROFESSIONAL SOCIETIES

Society for American Archaeology
Plains Anthropological Association
South Dakota Archaeological Society
North Dakota Archaeological Association
Minnesota Archaeological Society
Minnesota Historical Society
Lambda Alpha

PAPER PRESENTATIONS

1979 First Flint Hills/Osage Hills Conference, Norman, Oklahoma. "Plains Village Manifestations in the El Dorado Reservoir, Kansas."

PUBLICATIONS (articles)

1982 (with Kenneth Brown and Ned H. Hanenberger). Prehistoric Stone Tools of South Dakota: A Guide. South Dakota Archaeological Society, Special Publication, No. 6. Vermillion.

1979 An Analysis of the Smoky Hill Subsistence Pattern. In Kansas Working Papers in Anthropology, Vol. 4, University of Kansas, Lawrence.

CONTRACT ARCHAEOLOGY PUBLICATIONS

1981 (with M.J. Adair). The Two Deer Site (14BU55): A Plains Woodland-Plains Village Transition. In Phase II Investigations of Prehistoric and Historic Cultural Resources in El Dorado Lake, Kansas. Ed. by M.J. Adair. Report submitted to the U.S. Army Corps of Engineers, Tulsa District.

1982 Site 14BU57. In Archaeological Investigation at El Dorado Lake, Butler County, Kansas (Phase III). Assembled by P.E. Brockington, Jr. Report submitted to the U. S. Army Corps of Engineers, Tulsa District.

1982 (with other authors) Cultural Resources Along the South Dakota Segment of the Northern Border Pipeline. Report submitted to the Northern Border Natural Gas Company, Omaha.

1982 (with Kenneth Brown and Karen Zimmerman) Archaeological and Historical Reconnaissance and Literature Search of Cultural Resources Within the Pembina River Project, Pembina and Cavalier Counties, North Dakota. Report submitted to the U.S. Army Corps of Engineers, St. Paul District.

1982 (with Kenneth Brown and Karen Zimmerman) Prehistoric and Historic Resources Within the Jamestown Reservoir Project, North Dakota. Report submitted to the Bureau of Reclamation.

1982 (with Kenneth Brown and Karen Zimmerman) A Cultural Resources Survey of the Upper Minnesota River. Report submitted to the U.S. Army Corps of Engineers, St. Paul District.

1982 (with Kenneth Brown) Test Excavations of Four Sites in the Proposed Lonetree Dam and Dikes and New Rockford Canal, Wells County, North Dakota. Report submitted to the Bureau of Reclamation.

1982 (Dale Henning, Principal Investigator) Evaluative Investigations of Three Landmark Sites in Northwest Iowa. Luther College Archaeological Research Center, Decorah, Iowa.

1983 (with Kenneth Brown) Test Excavations at Site 13WD405, Woodbury County, Northwestern Iowa. Report submitted to the Office of the State Archaeologist of Iowa.

1983 (with Kenneth Brown) A Cultural Resources Survey of Three Timber Harvest Areas Within the Rosebud Timber Reserve, Todd County, South Dakota. Report submitted to the Bureau of Indian Affairs, Aberdeen, and Rosebud Sioux Tribe, South Dakota.

1983 (with Kenneth Brown) A Cultural Resources Survey of the Lower Brule Sioux Tribal Farm Irrigation Development Project #05-01-02084, Stanley County, South Dakota. Report submitted to the Lower Brule Sioux Tribe.

1983 (with Kenneth Brown) Cultural Resource Investigations of the Walhalla Alcohol Fuel Plant Facility, Pembina County, North Dakota. Report submitted to City of Walhalla and Red River Regional Planning Council, Grafton, N.D.

PROFESSIONAL POSITIONS

Supervisor, The University of South Dakota Archaeology Laboratory (Fall 1982 to Present).

REFERENCES

Dr. Larry Zimmerman
Director, Anthropology Program
Department of Social Behavior
University of South Dakota
Vermillion, South Dakote 57069
605-677-5401

Dr. Alfred E. Johnson
Director, Museum of Anthropology
University of Kansas
Lawrence, Kansas 66045
913-864-4245

Dr. Larry D. Martin
Associate Curator, Museum of Natural History
University of Kansas
Lawrence, Kansas 66045
913-864-3230

VITAE

Barbara A. Biggs
1000 8th St. S.E. #11
Minneapolis, MN 55414
Ph. (612) 379-7650

Permanent Address:
202 S. Filmore
Pierre, SD 57501
Ph. (605) 224-4304

Education:

University of Minnesota
Graduate School
Presently attending

University of South Dakota
Master of Public Administration
Degree conferred July 1981

Black Hills State College
B.S. - Dbl. Mjr., Pol. Sci./Mass Comm.
Degree conferred August 1979

Work Experience:

Planner — July 1982 - August 1982
Siouxland Interstate Metropolitan Planning Council
601 Insurance Exchange Building
Sioux City, IA 51101

Prepared a successful grant application to establish a loan fund for South Sioux City businesses experiencing economic hardship due to the closing of the Siouxland Veterans Memorial Bridge. Performed a land use survey of the northern half of the city. Designed a revolving loan fund. Prepared a proposal for the city council. Wrote notices and updates for newspapers and newsletters.

Research Associate — July 1981 - November 1981
Institute of Indian Studies
University of South Dakota
Vermillion, SD 57069

Worked under contract from the Bureau of Indian Affairs through the University of South Dakota researching the taxation of Indian trust lands on the Omaha and Winnebago Reservations. Reviewed personal Indian files. Abstracted and indexed land titles. Located, recorded and tabulated tax records from 1910 to 1970.

Census Taker — April 1-21, 1980
Bureau of the Census
Vermillion, SD 57069

Responsible for canvassing neighborhoods. Gathered surveys and conducted interviews for the '80 Census.

Graduate Assistantships:

Research Assistant — August 1980 - June 1981
Governmental Research Bureau
University of South Dakota

Updated 1975 publication South Dakota Facts. Researched and gathered statistics. Recorded information.

Graduate Assistant — March 1981 - June 1981
Allied Health Services
University of South Dakota

Developed computer library for health books and publications relevant to the program. Researched the nursing shortage. Prepared a statistical profile of South Dakota medical students and residents.

Research Assistant — August 1979 - May 1980
Governmental Research Bureau
University of South Dakota

Worked on Social Indicators: Quality of Life Research, a computer bank for recording indicators of the quality of life in South Dakota. Researched and gatered statistics. Recorded information.

References Available Upon Request

Dennis R. Beissel
648 Como Avenue
St. Paul, Minnesota 55103

home: (612) 489-142
business: (612) 831-248

PROFESSIONAL OBJECTIVE: To serve as project manager or equivalent role with private industry or consulting firm and to continue professional development in marketing and administration.

CERTIFICATION: Certified Professional Geologist No. 6010 (AIPG)

RELEVANT EXPERIENCE:

September, 1981 to Present — Senior Hydrogeologist
Environmental Engineering & Management, Ltd.
Minneapolis, Minnesota

Responsibilities included subcontractor management, supervision of geotechnical staff, and business development. Projects included design of ground water monitoring systems, investigation of hazardous waste spills, hydrogeologic site evaluation, and geologic analysis.

June, 1978 to September, 1981 (part-time) — President
Bloomgren-Beissel, Inc.

Hydrogeologic consultants. Professional consulting firm specializing in hydrogeology, water supply, flood plain hazard mitigation studies, research and report writing, expert testimony. Responsibilities included marketing and company operations.

February, 1980 to September, 1981 — State Ground Water Specialist
Classification: Principal Hydrologist
Minnesota Department of Natural Resources

Supervise and direct staff of 6-11 professionals, including senior level hydrologists, in the planning, design and implementation of state-wide ground water data collection and analysis program. Coordinate Department's ground water activities with other state and federal agencies. Provide testimony as Department's expert witness on ground water matters.

April, 1978 to February, 1980 — Hydrogeologist
Classification: Senior Hydrologist
Minnesota Department of Natural Resources

Supervise professional ground water staff; plan, design, and initiate ground water data collection program, areal hydrogeologic studies, aquifer delineation investigations, geophysical and remote sensing surveys and aquifer tests.

October, 1977 to April, 1978	Liaison - Minnesota Department of Natural Resources Division of Waters & Soil and Water Conservation Districts Responsible for technical training in ground water hydrology and hydraulics and for administrative training in water management for Soil and Water Conservation District personnel.
November, 1976 to October, 1977	Hydrogeologist West Virginia Geological and Economic Survey Morgantown, West Virginia Responsible for initiation and supervision of projects and programs in basic and applied hydrogeologic research. Projects included hydrogeochemical sampling for uranium exploration; determining surface and deep coal mining effects on water supplies; ground water supply evaluation; and technical assistance to the general public.
August, 1971 to November, 1976	Hydrogeologist South Dakota Geological Survey Vermillion, South Dakota Responsible for supervision and direction of county-wide geologic and water resource study, rural water supply investigations, test drilling program, aquifer tests, and geophysical well logging. Field supervisor for drilling and survey crews and geologic assistants.
September, 1969 to June, 1971	Research Assistant Colorado State University - Geology Department Ft. Collins, Colorado Assisted in projects to classify pollution potential of mountain dwelling sites. Hands-on experience with surface geophysical techniques, well logging equipment and mapping of rock fractures.
Summer, 1969	Geologist - Division of Waters Minnesota Department of Natural Resources Responsible for collection and compilation of hydrologic and geologic data for limnological surveys in southwest Minnesota and geologic analysis of well logs.
Summer, 1968	Geologic Field Camp Colorado State University White River Plateau, Colorado

Summer, 1966 & 1967	Full-time replacement worker Armour and Company packing plant South St. Paul, Minnesota
Noncompensatory Work	Coordinator - 1979 Midwest Groundwater Conference, Bloomington, Minnesota
	Thesis Committee Member - West Virginia University
	Instructor - University of South Dakota. Directed reading course in hydrogeology for graduate students.
ADDITIONAL TRAINING:	University of Wisconsin - Engineering short course: Groundwater Computer Models, 1980.
	The Pennsylvania State University - Short course: Fundamentals of Water Pollution Control in Coal Mining, 1977.
	West Virginia University - Field Conference: Geologic Hazards, 1977.
	Eastern Regional Remote Sensing Applications Center - NASA, Goddard: Computer Enhancement of LANDSAT Imagery, 1979 & 1980.
	University of Minnesota - Short Courses: Irrigation System Design and Scheduling, 1978; How to Sell Effectively, 1982.
	State of Minnesota Personnel Development Program, 1977 - 1981: Basic Management Functions Managing the Human Resource Supervisor's Role in State Government Performance Appraisal Citizen's Participation
	Minnesota Association of Commerce and Industry: Hazardous Materials, 1981.
	St. Paul TVI: Principles of Small Business Management, 1979.

PROFESSIONAL SOCIETIES:

American Institute of Professional Geologists (AIPG)
National Water Well Association (NWWA)
American Water Resources Association (AWRA)
American Society for Testing and Materials (ASTM)
Scientific Research Society (Sigma Xi)
Minnesota Water Well Association (MWWA)

PUBLICATIONS AND REPORTS:

Beissel, D.R. and Ford, D.R., 1981. Hydrologic Effects of Quarry Dewatering on Dean Lake, Scott County, MN: 1981 International Symposium on Urban Hydrology, Hydraulics, and Sediment Control, University of Kentucky, Lexington, KY.

Beissel, D.R. and Kerber, A., 1981. Ground Water Use Inventory in Minnesota Using Landsat Data: Proceedings, Second Eastern Regional Remote Sensing Applications Conference, NASA Conference Publication 2198.

Beissel, D.R. and Fax, J.G., 1981. Ground Water Hydrology of Lac qui Parle County, Minnesota: Minnesota DNR-Waters Bulletin in prep.

Fax, J.G. and Beissel, D.R., 1981. Ground Water Hydrology of Swift County, Minnesota: Minnesota DNR-Waters Bulletin No. 28.

Beissel, D.R., et. al., 1980. Selected Aquifer Tests in Minnesota: Minnesota DNR-Waters Technical Paper No. 8.

Beissel, D.R., 1980. Irrigation Well Inventory of Sherburne County, Minnesota, using LANDSAT MSS imagery: Proceedings, First Eastern Regional Remote Sensing Applications Conference, Easton, MD.

Arkle, T., Beissel, D.R., et. al., 1979. The Mississippian and Pennsylvanian (Carboniferous) Systems in the United States, D, West Virginia and Maryland: U.S. Geological Survey Professional Paper 1110 D.

Stach, R.L., Helgerson, R.N., Bretz, R.F., Tipton, M.J., Beissel, D.R., and Harksen, J.C., 1978. Arsenic Levels in the Surface and Ground Waters Along Whitewood Creek, Belle Fourche River, and a Portion of the Cheyenne River, South Dakota: South Dakota Water Resources Research Institute Completion Report A-054-SDAK.

Beissel, D.R., Larese, R.E., Nuhfer, E.B., 1977. Index to Surface Mining in West Virginia: West Virginia Geological and Economic Survey, Morgantown, West Virginia.

Beissel, D.R., Barari, A., 1976. Ground Water Study for the Brookings-Deuel Rural Water System, South Dakota: South Dakota Geological Survey Open-file report.

Beissel, D.R., Barari, A., 1976. Ground Water Study for the East Gregory Rural Water System, South Dakota: South Dakota Geological Survey Open-file report.

Beissel, D.R., 1975. Geology of Deuel County, South Dakota: South Dakota Cooperative Extension Service Pamphlet.

Beissel, D.R., in prep. Geology and Water Resources of Deuel and Hamlin Counties, South Dakota: South Dakota Geological Survey Bulletin.

Beissel, D.R., 1978. Aquifers and Ground Water Production Zones for Minnesota RDC Region 6E; Pilot Study for State-wide Water Information Management System.

Administrative Training Packet for Soil and Water Conservation Districts in Minnesota, 1977.

Aquifer Test Analyses and Engineering Reports to Water Resource Management administrators and to clients.

COMMUNITY ORGANIZATIONS:

PTA

Minnesota Science Museum

W.H. Over Museum (South Dakota)

Boy and Girl Scouts of America

PERSONAL DATA:

Born: December 5, 1947, St. Paul, Minnesota
Married, two children
High School Graduation - 1965, Hill-Murray, St. Paul, Minnesota

APPENDIX C

Field Notes

October 26, 1982

We (Ken and Marie Brown) left Vermillion for St. Paul in the late morning. It was dark when we arrived in St. Paul and it took us awhile to find a motel.

October 27, 1982

In the morning we went to the Corps of Engineers office in downtown St. Paul to meet with Sandy Blaylock concerning the Lake Traverse project. We borrowed some infrared photos of Lake Traverse. After lunch, we went to the Minnesota Archaeological Society at Ft. Snelling to check their site files for sites in or near the project area. All pertinenet data was recorded and/or xeroxed.

October 28, 1982

In the morning, we went to the Minnesota Secretary of State's Office to get copies of the General Land Office (GLO) maps for the Minnesota portion of the project area. A stop was made at the Minnesota Historical Society. After lunch, we left for Wheaton, MN. It was dark when we arrived. There is only one motel in Wheaton and it is our headquarters for the fieldwork portion of the project.

October 29, 1982

We got up early and headed for the south end of the project area near Browns Valley. The day was mostly cloudy. The Corps property was traversed along parallel transects and shovel tests were dug. Ground visibility was zero. Alot of brush and undergrowth is along the dike area on both sides. It is very swampy on both sides of the dike. No cultural material was observed (except beer cans, wrecked boat dock). We ate lunch in Browns Valley. After lunch, we returned to the survey area. Since the land adjacent to the Corps property was in cultivation, and had 100 percent ground visibility, we surveyed along the edge of the field. Cultural material (pottery, lithics, bone, mussel shell) was observed and recovered throughout the area up to the edge of the Corps property, suggesting that it extends onto Corps land. The site is located on higher ground than the majority of the Corps property. Shovel tests on Corps property did not yield any artifacts. This site is huge. It extends into the field on the south side of the highway. This portion of the site is in South Dakota. We will return to test the site and determine if it extends below plowzone and onto Corps property (site #1).

It was late afternoon when we finished surveying the southern project area and went to the Minnesota side of the middle project area. Areas of Corps property not under water were traversed and shovel tested. Rodent backdirt piles where inspected. Eroded shoreline banks were examined. No cultural material was observed or recovered. It was almost dark when we returned to our motel room.

October 30, 1982

We got up early and headed for the north end of the project area. It was a sunny, windy day. Starting on the north side of the highway at the west end of the Corps property we traversed parallel transects at 15 to 20 meter intervals which paralleled the highway to the Bois de Sioux River. Shovel tests were dug. Ground visibility was zero in most areas. Some

areas were plowed food plots with 100 percent visibility. Alot of large boulders and stones were in the area. Rodent backdirt piles were inspected. Swampy areas were encountered. No cultural material was observed or recovered. In addition, two transects on all cultivated land adjacent to Corps property was traversed in order to have 100 percent ground visibility. But no cultural material was observed or recovered. After we finished surveying the area north of the highway (White Rock Dam) we began on the south side of the highway, using the same field methods. The area was mostly all grasses and marshlands. Several food plots were checked which had 100 percent visibility. All other areas had zero visibility. We stopped withen it became too dark to continue any longer.

The areas surveyed today are basically flat and low-lying, with some areas being swampy. Abundant glacial till was visible, especially in the cultivated fields. The presence of literally millions of small gastropod shells atest to the former prolonged inundation of the terrain. Maybe Dennis Biessel will be able to expand on this when he comes on Monday (Nov. 1).

October 31, 1982

We started early and headed for the north end again. Before continuing where we left off yesterday, we stopped at the house of the custodian of the Corps property to verity the locations of the Corps boundaries and to inform his of our presence in the area. His house is on the north side of the highway on the east bluff overlooking the Bois de Sioux River and White Rock Dam. This deone, we continued where we stopped yesterday. Field methods were the same. No cultural material was observed or recovered. After finishing south of the highway, we surveyed the Corps property on the bluffs by the custodian's house. Ground visibility was zero. No cultural material was observed or recovered. Lastly, we surveyed the Corps land (north of the highway) between the Bois de Sioux River and the bottom of the bluffs. This tract of land is a cultivated field (food plot for wildlife) situated on a terrace of the Bois de Sioux River. The same field methods as used previously were continued. Ground visibility ragned from 50 to 100 percent. A very thin scatter of lithic material (flakes, shatter, point fragment) was recovered. We will test the site tomorrow. It was dark by the time we returned to our motel room.

November 1, 1982

We started early and returned to the site we found yesterday by White Rock Dam. A 1 x 1 meter test pit was dug to a depth of 30 cm (site #2). All dirt was sifted through quarter inch hardware cloth. No additional cultural material was recovered and no subsurface features were discerned. The site appears to have been destroyed by cultivation and extensive erosion. The test pit was backfilled.

We drove to the Reservation Dam (middle project area) and surveyed the Corps lands on the South Dakota side. The same field methods were used. In addition, the area contained newly plowed food plots and these were carefully examined for cultural material. Except for 100 percent ground visibility in the food plots, ground visibility was zero. Millions of gastropods were visible in the food plots. Historic material was recovered from several food plots located north of the highway at the west edge of Mud Lake. A pine tree and an artificial mound containing historic material also attested to the former presence of a historic structure. A 1 x 1 meter test pit was excavated to a depth of 40 cm in the artificial mound.

All dirt was sifted through quarter inch hardware cloth. Historic cultural material was encountered throughout the unit. Excavation units were in arbitrary 10 cm levels. A historic structure definitely occupied this location in the past. Maby Karen (historian) can find something about it in the Roberts County historic records. The surrounding area is marshy. Why did anyone want to have a house by a marsh? The test pit was backfilled.

We met Dennis Biessel, or geomorphologist, at 1:00 PM in Browns Valley. After lunch, we drove Dennis around the project area. Before construction of the dike and dams, most of the project area was probably wet much of the time. It was dark when we returned to our motel room. We will finish the fieldwork tomorrow.

November 2, 1982

We checked out of our motel room and headed for Browns Valley and the first site we found (#1). We left Dennis to condut his fieldwork, alone. We excavated a 1 x 1 meter test pit on Corps property adjacent to and north of the cultivated field in which we found the site. The location of the unit had been formerly cultivated as confirmed by the present owner of the cultivated field. The unitw as dug to a depth of 37 cm. The plowzone extended to 27 cm. All dirt was sifted though quarter inch hardware cloth. A single retouched flake and pieces of charcoal were recovered from below the plowzone, indicatiing that a portion of the site is probably intact and extends onto Corps Property. The man who farms the adjacent cultivated field verified the large size of the site. he has recovered grooved mauls and projectile points from the site. We headed for Vermillion after we finished backfilling the test pit, arriving home in the late evening.

005 Site Number #1 (39RO45/21TR35)

010 Catalog Number _____

015 Assemblage _____

020 Horizontal Provenience: X _____ Y _____

Flotation _____

025 Depth: Elevation _____ Below Surface 0-20 cm

030 Excavation Unit Number 1, Level 1

095 Date Collected 2 / 11 / 82
DD / MMM / YYYY

098 Sterile - flakes, etc.

099 Remarks

Very clayey, black soil

005 Site Number #1

010 Catalog Number _____

015 Assemblage _____

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface 20-30 cm

030 Excavation Unit Number 1, Level 2

095 Date Collected 2/11/82
DD / MM / YYYY

098 Sterile

099 Remarks 1 flake, flecks of charcoal,

005 Site Number #3 (39RO44)

010 Catalog Number _____

015 Assemblage _____

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface 0-10 cm

030 Excavation Unit Number 1, Level 1

095 Date Collected 1/ 11 /82
DD MMM YYYY

098 Sterile

099 Remarks Lots of historic junk, stones, glass, etc.

005 Site Number #3

010 Catalog Number _____

015 Assemblage _____

020 Horizontal Provenience: X _____ Y _____

Flotation _____

025 Depth: Elevation _____ Below Surface 10-20cm

030 Excavation Unit Number 1, Level 2

095 Date Collected 11 / 1 / 82
DD MM YYYY

098 Sterile

099 Remarks Same as 0-10 cm

005 Site Number #3

010 Catalog Number _____

015 Assemblage _____

020 Horizontal Provenience: X _____ Y _____

Flotation _____

025 Depth: Elevation _____ Below Surface 20-30

030 Excavation Unit Number 1, Level 3

095 Date Collected 1 / 11 / 82
DD / MM / YYYY

098 Sterile Same as above

099 Remarks

005 Site Number #3

010 Catalog Number _____

015 Assemblage _____

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface 30-40cm

030 Excavation Unit Number 1, Level 4

095 Date Collected 1 / 11 / 82
DD / MM / YYYY

098 Sterile same as above,

099 Remarks larger rocks present.

005 Site Number #2 (21TR-FS1)

010 Catalog Number _____

015 Assemblage _____

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation 0-27 cm Below Surface 0-27cm

030 Excavation Unit Number 1, Level 1

Plowzone extends 27cm deep -

095 Date Collected 1 / 11 / 82
DD / MMM / YYYY

098 Sterile yes

099 Remarks

005 Site Number #[redacted] 2

010 Catalog Number _____

015 Assemblage _____

020 Horizontal Provenience: X _____ Y _____

Flotation _____

025 Depth: Elevation _____ Below Surface 22-32

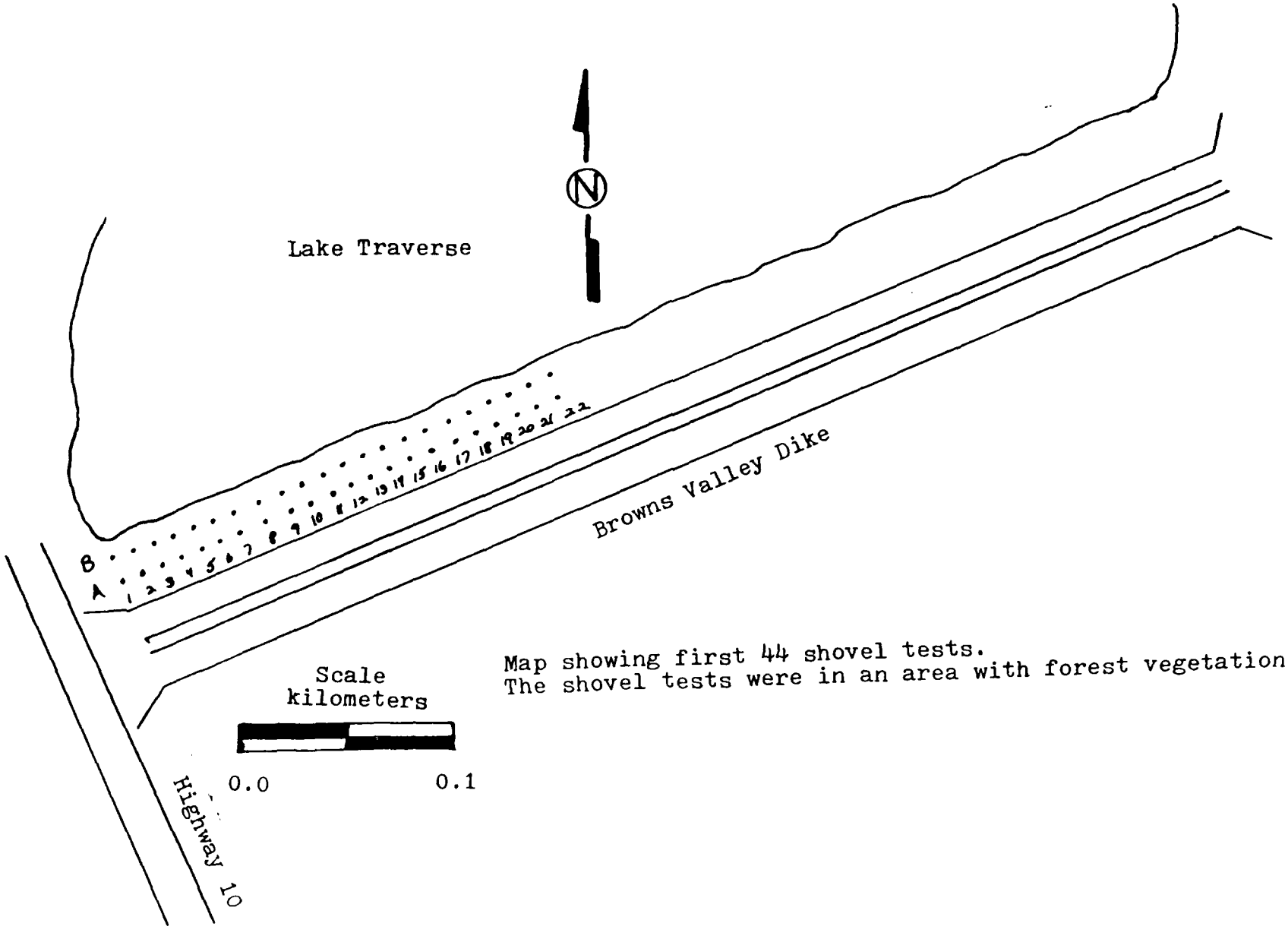
030 Excavation Unit Number 1, Level 2

very sandy!

095 Date Collected 1 / 11 / 82
DD / MM / YYYY

098 Sterile yes -

099 Remarks



Map showing first 44 shovel tests.
The shovel tests were in an area with forest vegetation.

005 Site Number _____

010 Catalog Number _____

015 Assemblage _____

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface_____

030 Excavation Unit Number _____

095 Date Collected _____
DD MMM YYYY

098 Sterile

099 Remarks

005 Site Number _____

010 Catalog Number _____

015 Assemblage _____

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface_____

030 Excavation Unit Number _____

095 Date Collected _____
DD MMM YYYY

098 Sterile

099 Remarks

005 Site Number _____

010 Catalog Number _____

015 Assemblage _____

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface_____

030 Excavation Unit Number _____

095 Date Collected _____
DD MMM YYYY

098 Sterile

099 Remarks

005 Site Number _____

010 Catalog Number _____

015 Assemblage _____

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface_____

030 Excavation Unit Number _____

095 Date Collected _____
DD MMM YYYY

098 Sterile

099 Remarks

005 Site Number _____

010 Catalog Number _____

015 Assemblage _____

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface_____

030 Excavation Unit Number _____

095 Date Collected _____
DD MMM YYYY

098 Sterile

099 Remarks

005 Site Number _____

010 Catalog Number _____

015 Assemblage _____

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface_____

030 Excavation Unit Number _____

095 Date Collected _____
DD MMM YYYY

098 Sterile

099 Remarks

005 Site Number _____

010 Catalog Number _____

015 Assemblage _____

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface_____

030 Excavation Unit Number _____

095 Date Collected _____
DD MMM YYYY

098 Sterile

099 Remarks

005 Site Number _____

010 Catalog Number _____

015 Assemblage _____

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface_____

030 Excavation Unit Number _____

095 Date Collected _____
DD MMM YYYY

098 Sterile

099 Remarks

005 Site Number _____

010 Catalog Number _____

015 Assemblage _____

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface_____

030 Excavation Unit Number _____

095 Date Collected _____
DD MMM YYYY

098 Sterile

099 Remarks

005 Site Number _____

010 Catalog Number _____

015 Assemblage _____

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface_____

030 Excavation Unit Number _____

095 Date Collected _____
DD MMM YYYY

098 Sterile

099 Remarks

005 Site Number _____

010 Catalog Number _____

015 Assemblage _____

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface_____

030 Excavation Unit Number _____

095 Date Collected _____
DD MMM YYYY

098 Sterile

099 Remarks

005 Site Number _____

010 Catalog Number _____

015 Assemblage _____

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface_____

030 Excavation Unit Number _____

095 Date Collected _____
DD MMM YYYY

098 Sterile

099 Remarks

005 Site Number _____

010 Catalog Number _____

015 Assemblage _____

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface_____

030 Excavation Unit Number _____

095 Date Collected _____
DD MM YYYY

098 Sterile

099 Remarks

005 Site Number _____

010 Catalog Number _____

015 Assemblage _____

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface_____

030 Excavation Unit Number _____

095 Date Collected _____
DD MMM YYYY

098 Sterile

099 Remarks

005 Site Number _____

010 Catalog Number _____

015 Assemblage _____

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface_____

030 Excavation Unit Number _____

095 Date Collected _____
DD MMM YYYY

098 Sterile

099 Remarks

005 Site Number _____

010 Catalog Number _____

015 Assemblage _____

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface_____

030 Excavation Unit Number _____

095 Date Collected _____
DD MMM YYYY

098 Sterile

099 Remarks

005 Site Number _____

010 Catalog Number _____

015 Assemblage _____

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface_____

030 Excavation Unit Number _____

095 Date Collected _____
DD MMM YYYY

098 Sterile

099 Remarks

005 Site Number _____

010 Catalog Number _____

015 Assemblage _____

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface_____

030 Excavation Unit Number _____

095 Date Collected _____
DD MMM YYYY

098 Sterile

099 Remarks

005 Site Number _____

010 Catalog Number _____

015 Assemblage _____

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface_____

030 Excavation Unit Number _____

095 Date Collected _____
DD MMM YYYY

098 Sterile

099 Remarks

005 Site Number _____

010 Catalog Number _____

015 Assemblage _____

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface_____

030 Excavation Unit Number _____

095 Date Collected _____
DD MMM YYYY

098 Sterile

099 Remarks

005 Site Number _____

010 Catalog Number _____

015 Assemblage _____

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface_____

030 Excavation Unit Number _____

095 Date Collected _____
DD MM YYYY

098 Sterile

099 Remarks

005 Site Number _____

010 Catalog Number _____

015 Assemblage _____

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface_____

030 Excavation Unit Number _____

095 Date Collected _____
DD MMM YYYY

098 Sterile

099 Remarks

005 Site Number _____

010 Catalog Number 1B

015 Assemblage Shovel Test

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface_____

030 Excavation Unit Number _____

095 Date Collected 29 (DD) 10 (MM) 1982 (YYYY)

098 (Sterile)

099 Remarks

005 Site Number _____

010 Catalog Number 2B

015 Assemblage Shovel Test

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface_____

030 Excavation Unit Number _____

095 Date Collected 29 (DD) 10 (MM) 1982 (YYYY)

098 Sterile

099 Remarks

005 Site Number _____

010 Catalog Number 3B

015 Assemblage Shovel Test

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface_____

030 Excavation Unit Number _____

095 Date Collected 29 (DD) 10 (MM) 1982 (YYYY)

098 Sterile

099 Remarks

005 Site Number _____

010 Catalog Number 4B

015 Assemblage Shovel Test

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface_____

030 Excavation Unit Number _____

095 Date Collected 29 10 1982
DD MM YYYY

098 Sterile

099 Remarks

005 Site Number _____

010 Catalog Number 5B

015 Assemblage Shovel Test

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface_____ _____

030 Excavation Unit Number _____

095 Date Collected 29 10 1982
DD MMM YYYY

098 Sterile

099 Remarks

005 Site Number _____

010 Catalog Number 6B

015 Assemblage Shovel Test

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface_____

030 Excavation Unit Number _____

095 Date Collected 29 10 1982
DD MM YYYY

098 Sterile

099 Remarks

005 Site Number _____

010 Catalog Number 7B

015 Assemblage Shovel Test

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface_____

030 Excavation Unit Number _____

095 Date Collected 29 (DD) 10 (MMM) 1982 (YYYY)

098 Sterile

099 Remarks

005 Site Number _____

010 Catalog Number 8B

015 Assemblage Shovel Test

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface_____

030 Excavation Unit Number _____

095 Date Collected 29 10 1982
DD MMM YYYY

098 Sterile

099 Remarks

005 Site Number _____

010 Catalog Number 9B

015 Assemblage Shovel Test

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface_____

030 Excavation Unit Number _____

095 Date Collected 29 (DD) 10 (MMM) 1982 (YYYY)

098 Sterile

099 Remarks

005 Site Number _____

010 Catalog Number 10 B

015 Assemblage Shovel Test

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface_____

030 Excavation Unit Number _____

095 Date Collected 29 (DD) 10 (MMM) 1982 (YYYY)

098 Sterile

099 Remarks

005 Site Number _____

010 Catalog Number 11B

015 Assemblage Should Test

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface_____

030 Excavation Unit Number _____

095 Date Collected 29 (DD) 10 (MM) 1982 (YYYY)

098 Sterile

099 Remarks

005 Site Number _____

010 Catalog Number 12 B

015 Assemblage Shovel Test

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface_____

030 Excavation Unit Number _____

095 Date Collected 29 10 1982
DD MMM YYYY

098 Sterile

099 Remarks

005 Site Number _____

010 Catalog Number 13B

015 Assemblage Shovel Test

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface_____

030 Excavation Unit Number _____

095 Date Collected 29 (DD) 10 (MM) 1982 (YYYY)

098 Sterile

099 Remarks

005 Site Number _____

010 Catalog Number 14 B

015 Assemblage Shovel Test

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface_____

030 Excavation Unit Number _____

095 Date Collected 29 (DD) 10 (MMM) 1982 (YYYY)

098 Sterile

099 Remarks

005 Site Number _____

010 Catalog Number 15 B

015 Assemblage Shovel Test

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface_____

030 Excavation Unit Number _____

095 Date Collected 29 (DD) 10 (MMM) 1982 (YYYY)

098 Sterile

099 Remarks

005 Site Number _____

010 Catalog Number 16 B

015 Assemblage Shovel Test

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface_____

030 Excavation Unit Number _____

095 Date Collected 29 (DD) 10 (MMM) 1982 (YYYY)

098 Sterile

099 Remarks

005 Site Number _____

010 Catalog Number 17B

015 Assemblage Shovel Test

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface_____

030 Excavation Unit Number _____

095 Date Collected 29 10 1982.
DD MM YYYY

098 Sterile

099 Remarks

005 Site Number _____

010 Catalog Number 18 B

015 Assemblage Shovel Test

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface_____

030 Excavation Unit Number _____

095 Date Collected 29 10 1982
DD MMM YYYY

098 Sterile

099 Remarks

005 Site Number _____

010 Catalog Number 19 B

015 Assemblage Shovel Test

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface_____

030 Excavation Unit Number _____

095 Date Collected 29 (DD) 10 (MM) 1982 (YYYY)

098 Sterile

099 Remarks

005 Site Number _____

010 Catalog Number 20 B

015 Assemblage Shovel Test

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface_____

030 Excavation Unit Number _____

095 Date Collected 29 10 1982
DD MMM YYYY

098 Sterile

099 Remarks

005 Site Number _____

010 Catalog Number 21 B

015 Assemblage Shovel Test

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface_____

030 Excavation Unit Number _____

095 Date Collected 29 10 1982
DD MM YYYY

098 Sterile

099 Remarks

005 Site Number _____

010 Catalog Number 22 B

015 Assemblage Shovel Test

020 Horizontal Provenience: X_____ Y_____

Flotation_____

025 Depth: Elevation_____ Below Surface_____

030 Excavation Unit Number _____

095 Date Collected 29 10 1982
DD MMM YYYY

098 Sterile

099 Remarks

APPENDIX D

Corps' Review Comments, Responses

Corps of Engineers comments on the draft report Cultural Investigations at the Lake Traverse-Bois De Sioux Project, Roberts County, South Dakota, Traverse County, Minnesota

1. Please check the entire report for typographical errors.

2. Management Summary: p. iv: If the two sites are potentially eligible, then further testing to determine their eligibility should be recommended, before some form of salvage and excavation is recommended. Further, if none of the sites are eroding or in immediate danger, why is mitigation work recommended at all? Lastly, if these sites "need to be protected for future generations", then why is salvage/testing/excava recommended instead of some form of mitigation by preservation?

3. p. ii, x, and 62: The "Minnesota Archaeological Society" is the Minnesota Historical Society.

4. p. 1: "DACW37-83-M2193" should be DACW37-82-M-2193.

5. p. 3-5: During the review of past work, please indicated the proximity of the sites and work in relation to the project area.

6. p. 5: What is the site number for the Shady Dell site?

7. Site Forms: The site form for 39R044 states that "the site is not deemed eligible for nomination to the National Register". Please clarify.

8. p. 43: Remove the quote from Kieserling (1970). It has no relevance to the history of the project area and contains questionable and negative secondary information on the character of Chief Sweetcorn.

9. Table 9: What is the date of the source, and where is it on file?

10. Euro-American Period (Post 1640):

a. P. 45 para 1: While the historic sections provide detailed information there appears no rationale for selection and exclusion of that detail. Also, the larger historical processes at work are not identified. Motivations behind exploration, the fur trade, American Indian policy, and immigration history, for example, are not related to the detail presented or how they relate to the project area. These processes should be addressed in the final report.

b. P. 45 para 1, last sentence: In 1763 the British officially ousted the French from Canada. Before, this time the French had more control of southern Canada and the north central parts of the future United States than the British. See Arthur J. Ray Indians in the Fur Trade (1974) and Harold A. Innis The Fur Trade in Canada (1931). The draft report sentence is generalized and does not adequately address the complexness of the events during that time period.

c. P. 45 para 2: Competition between English and American traders and between various Indian tribes shaped Indian-white relations significantly in the Lake Traverse area. The draft report does not address this. (See comment 10a).

d. P. 45 para 2: Who are the major figures in these fur companies and are they significant in their own right?

3. P. 45: Throughout the historic section various subjects are discussed two or more times. The fur trade, the Selkirk colony, Red River oxcart trails and the elevators in the Lake Traverse area are examples. As a result, no description is complete. For example in this paragraph (para 3) the Selkirk colony is discussed but no information is given about what it is, who founded it, how long its lasted or its relation to the project area. Some of these aspects are later reported in paragraph 2, page 56 in a section on Red River Trails. The historic overview should be reorganized and reworked to tie all this information together.

f. P. 45-46 para 4: Long's expedition reveals the extent of the fur trade and Indian activity in the Lake Traverse area during the summer of 1823. See Lucile M. Kane, June D. Holmquist and Carolyn Gilman eds The Northern Expeditions of Stephen H. Long: The Journals of 1817 and 1823 and Related Documents (1978). The report provides background facts on the expedition, but nothing of substance.

g. P. 50 para 3: What forces pulled these immigrants to this area of Minnesota?

11. P. 50 para 2 and 5; p. 51 para 1: These paragraphs have no relevance to the study. Remove them or make them applicable to the present study.

12. P. 51 a) para 3: Are the locations of the fur posts known? Do they have site numbers?

b) The fur trade was an Indian trade, also. What were the various bands of the Sioux doing in this area? How were they participating in the fur trade? How was their material culture changing?

c) P. 51 para 2: The east shore of Lake Traverse had greater accessibility to or from what?

d) P. 51: What is known about the present location and condition of the Hudson Bay Company post? Where is the Shady Dell Farm?

e) P. 51 para 3: In the early 1790's, Dickson built a fort on Lake Traverse's eastern shore, opposite a village of the Teton Sioux; "for the next decade it was his trading headquarters, even his home, for in 1797 he married the sister of a Sioux chief who lived there". p. 35 Lavender, David. The Fist in the Wilderness (reprinted 1979).

13. P. 52 para 1: Is the Fisk (1966) quote in relation to the Hudson Bay Company post?

14. P. 53-54: When did Red River oxcarts become important? What were they important for?

15. General historic overview: Through the historic overview, references are made to fur trading posts, historic Indian villages, and other potentially signicant historic sites. These sites should be discussed in relation to their probable location to the project area. The overview clearly indicates the significance of the Lake Traverse area historically. The relationship of these historic sites and activites to the present project area and study needs to be more thoroughly discussed in the report. Should any of these sites be looked for in the field? The overview could more clearly tie in site 39RO45/21TR35 with the probable location and history of Standing Buffalo's Village, as well as 39RO44 with the early activities and designation of the Sisseton-Wahpeton Indian Reservation.

16. P. 53: Again, where are these probable fur trading post locations in relation to the project area?

17. P. 54 para 1: "Two shorter northerly routes and righteously outraged Indains with murderous impulses near Lake Traverse undoubtedly hurt the fur trade business (Gilman et al. 1979:43)." Gilman et al. (1979:43), does not say or even imply this at all. Where is this "information" from? Extreme care should be taken in correctly citing information from a professional source, particularly information that holds such a negative connotation. Statements such as this throughout the report should be double checked for the correct citations.

18. P. 54-55, Indian fort at Browns Valley: How does this information relate to the history of the area or to the contract work in the project area?

19. P. 55 para 2, and p. 54 para 1: These citations from Gilman et al (1979:43) need to be rechecked for clarity in their interpretation.

20. P. 62, The Archaeological Reconnaissance Methodology:

The methodology discussion and figures 3-8 should indicate what areas within the fee title land were surveyed and where shovel tests and 1 X 1 units were located. Since p. 2, para 4 gives a breakdown of vegetation/land use conditions on the Corps of Engineers fee title land, survey/testing techniques and survey limitations in each of these 6 broad areas should biscussed. It is assumed that survey/testing techniques in the ca. 3% agricultural land differed extremely from the 29% in grassland, or 6.5% in forest. It is further assumed that the 33% under water and 28% in wetlands were not surveyed, but the statement on p. 62 reads "A 100 percent pedestrian reconnaissance of all lands held in fee title by the U.S. Army Corps of Engineers (fig. 3-8) was conducted". The draft report further states: "Shovel tests were dug at 15 to 20 meter intervals in areas where ground visibility was less than 25 percent." Where were these shovel tests located (they are not located in figures 3-8)? Where are the shovel tests profile forms (required in section 4.06 of the Scope of Work and to be included in an appendix)? Why was the decision made to only shovel test with less than 25% visibility (see sections 4.06 and 4.09 of the Scope of Work)? What are the chances of missing sites in grassland and woodland conditions where subsurface testing is conducted only at the point where you can see one-fourth of what you are looking at? It would seem that shovel testing below at least 50% visibility would make the probability of missing sites, particularly light scatters, much less (see also comment #26).

21. P. 70, Prehistoric Pottery: Specific descriptions of the pottery types discovered during the survey should be included here. What about historic Indian pottery?

22. P. 71 Faunel Remains: Again, more specific descriptions of some of the specific remains discovered would be useful.

23. P. 71: Descriptions of applicable historic artifacts/types should be included.

24. Pp. 73-78, 39RO44 site description:

a. Figure 49:

(1) Where is the exact location of the test pit? There are no test unit boundaries on the map.

(2) Does the square for "farmhouse" depict the earth mound (10 meters in diameter) marking the house location?

(3) If "no remains of a barn were discerned", then why does the figure show the exact boundaries of the barn?

(4) How do we know the location of the Contractor's camp. Is there a data associated with this camp?

(5) There is no scale on the map.

(6) Where is the location of the datum?

b. Is Ide de Win Sweetcorn related to Chief Sweetcorn? The original allotment of the reservation land should be more thoroughly explained.

c. Is there evidence in the records that the buildings were constructed after 1904? Is it possible that Arthur Sweetcorn built them?

d. Locate the site datum location on figure 49 if possible, and/or on figure 7.

e. P. 74 para 4 and p. 78: If the foundation is covered with 1 meter of borrow fill, no natural stratigraphy would be expected. How did the test unit/results bear out the evidence that the foundation is covered with bottow, if only dug to 40cm and the fill is 1 meter deep? Why was the test unit placed in the middle of a mound of borrow fill and only due to 40cm? In the report "barrow" should be borrow. Where is all of the borrow fill/construction information from?

f. P. 74 & 78: If the buildings were moved or burned, and then covered with 1 meter of borrow fill, are the artifacts from the test unit from the borrow fill or mixed into the fill by natural processes? They would not necessarily be associated with the house foundation. How do you know that cultural remains extend below 40cm deep if you did not test below that level?

g. Recommendations: The recommendations section should discuss the project impacts to the site. Is the site in need of immediate attention?

25. Pp. 79-83, 39RO45/21TR35 site description:

a. P. 79, Cultural affiliation: Can you be more specific than "Prehistoric Indian"?

b. A site map showing the site boundaries, 1x1 test unit, datum, and other related information should be made for the final report.

c. Why was the 1 X 1 test unit excavated to only 27 cm? How was the test unit location decided on? What about the potential for more than one component, earlier buried components? Does the geomorphology of the area indicate the potential for multi-component buried sites?

d. Michael Michlovic, at Morrhead State University could be contacted to assist in determining the ceramic assemblage affiliation and the current distribution of known ceramics in the area.

e. Where is the site in relation to the Sam Brown Memorial Park, and Sam Brown's log house (i.e., the supposed loction of Standing Buffalo's Village)?

f. The recommendations should discuss the project impacts on the site, and the immediacy of any recommended work. The recommendations should also discuss the future work that is recommended to test the site for eligibility.

26. Pp. 84-85, 21 TR-FS1, site description:

a. Does the projectile point size or characteristics give you any idea of the cultural affiliation?

b. How was the 1 X 1 test unit location determined?

c. A site map will be included in the final report (see comment 24b).

d. Why was the test unit dug to only 30 cm?

e. How is it obvious "that a substantial amount of erosion has occurred at the site."

f. What about the potential for buried components? Does the geomorphology of the area support the potential for deposits deeper than 30 cm? Is one 1 X 1 test unit over a 30-acre site enough to determine that the site is disturbed and that there are no subsurface remains, expecially when the test unit was dug to only 30 cm?

g. Why did the Office of the State Archeologist only give the site a findspot number? Did you check with them on why they did this? It seems to us that it should have been given an official site number. The reason for the findspot designation should be cleared up

for the final report.

h. The recommendations section should discuss the project impacts on the site.

27. Because of the extremely high prehistoric and historic potential of the Lake Traverse area, why were only 3 sites discovered, all of which are of late prehistoric or historic cultural affiliation and were found only in cultivated field conditions? Where are all those other sites? What do the grasslands and woodlands hold?

28. Pp 87-95, Settlement Patterns: The results of the study's field reconnaissance, site testing, and geomophology should be tied in with the discussion of site types, soil types, geomorphology and hypotheses generated in this report section. Did the study and fieldwork help answer any questions or aid in testing any hypotheses? What about a comparison between the project areas where sites were located and where sites were not located?

29. P. 95-97, Recommendations and Proposal: If both sites are being considered potentially eligible at this point, further testing to determine their eligibility could be the first step. "Salvage/test excavation" and "Salvage/contiguous excavation" seem to imply by their titles that the sites have already been determined eligible and are being mitigated by excavation. As discussed previously in comment 2, excavation is not the only form of mitigation, nor is it in many cases the preferred form of mitigation. The recommendations and phase III proposal should be reworked with these comments in mind. "Phase III Testing and Research", as defined in Section 3.06 of the Scope of Work, is not just a mitigation phase. It is designed to test these sites defined in phase II as being potentially eligible, and the outcome of phase III is the development of a detailed mitigation plan.

30. Figures:

a. quad maps: What are all the dots within the site boundaries? What are the solid lines vs. hashed lines? There should be a key.

b. Site locations should be plotted on figure 2.

c. Project area and site loctions plotted on the GLO and other historic maps would make those figures really useful to the report. As they are now, it is impossible to know where you are, what you want to be looking at, and where the survey area and sites are. They become report filler instead of an incredibily useful historic resource.

d. figures 7 and 8 captions should indicate that the maps also show the location of 39RO44 (figure 7), and 39RO45/21TR35.

e. Other figure comments are located throughout these written comments where applicable.

All Corps comments have been addressed in the report.

END

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